Adonis-P
(Machine Code: G035)

SERVICE MANUAL

Subject to change
Ricoh Technical Service
July 30th, 1999

⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the printer power cord is unplugged.
2. The wall outlet should be near the printer and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. If the print job process starts before the printer completes the warm-up period, keep hands away from the mechanical and the electrical components because the printer starts printing sheets as soon as the warm-up period is complete.
5. The inside and the metal parts of the fusing unit become extremely hot while the printer is operating. Be careful to avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

1. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The printer's peripherals (except for paper tray unit) must be installed and maintained by a customer service representative who has completed the training course on those models.
2. The NVRAM on the controller board has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

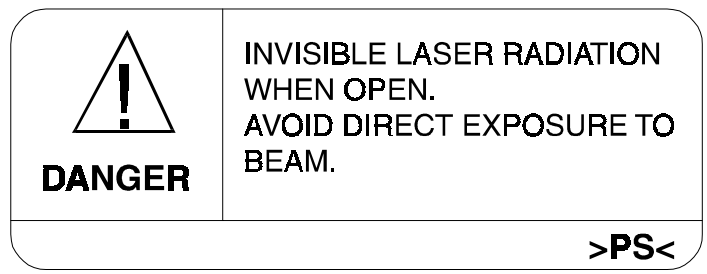
⚠WARNING

Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

⚠WARNING

WARNING: Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.

CAUTION MARKING:



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OPTION

PAPER TRAY UNIT (G520)

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1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

1.1.1 PRINTER

Configuration:	Desktop
Printing Process:	Dry electrostatic transfer system
Resolution:	600 x 600 dpi (PCL5e, PCL6, PS) 400 x 400 dpi (PS) 300 x 300 dpi (PCL5e, simulated by doubling pixel width and height at 600 dpi resolution)
Gray Scale:	256 levels
Printing Speed (Maximum)	45 ppm (A4/11" x 8.5" sideways, simplex) 36 ppm (A4/11" x 8.5" sideways, duplex)
Printing Emulation:	PCL5e and PCL6 PostScript Level 3
Printer Font:	PCL5e/PCL6: 45 scaleable typefaces in 14 typeface families (35 Intellifont and 10 TrueType format fonts) 6 bitmapped typefaces in the Line Printer typeface family PS: 136 Adobe Type1 fonts
Printer Interface:	Bi-directional Parallel x 1 Network Interface x 1 Ethernet (100 base-TX/10 base-T for TCP/IP, IPX/SPX, EtherTalk)
DRAM Capacity:	8 MB (Standard) 2 DRAM SIMM slots (up to 64 MB) Maximum Total: Up to 72 MB
Printer Driver:	PCL5e Printer Driver for Windows 3.1/95/98/NT PCL6 Printer Driver for Windows 3.1/95/98/NT PS3 Printer Driver for Windows 3.1/95/98/NT and Macintosh

Paper Size:	Maximum A3/11" x 17" Minimum A5/5.5" x 8.5" lengthwise (Paper tray/Duplex) A6/5.5" x 8.5" lengthwise (By-pass) Duplex: Standard sizes A5 lengthwise to A3 HLT to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm By-pass: Standard sizes A6 lengthwise to A3 HLT lengthwise to DLT Non-standard sizes Width: 100 to 300 mm Length: 148 to 432 mm
Paper Weight:	Paper Tray/Duplex: 64 ~ 105 g/m^2, 20 ~ 28 lb By-pass: 52 ~ 157 g/m^2, 16 ~ 42 lb
Warm-up Time:	Less than 100 s (23°C, 73°F)
First Print Time (1st Tray):	Less than 6.0 seconds A4/11" x 8.5" sideways
Auto Power Off (Energy Saver Mode):	30 minutes is the default setting; it can be changed using the user menu.
Paper Capacity:	Paper Tray: 500 sheets (up to 56 mm, 2.2") x 2 By-pass Feed: 50 sheets (up to 5.5 mm, 0.2") LCT: 1,500 sheets
Tray Capacity:	A4/11" x 8.5": 500 sheets A3/B4/8.5" x 14"/11" x 17": 250 sheets Standard tray
Toner Replenishment:	Cartridge exchange (700 g/cartridge)
Toner Yield:	23 k sheets printed (A4 sideways, 5% full black)

Power Source:

North America
120 V, 60 Hz, More than 10 A
Europe/Asia
220 ~ 240 V, 50/60 Hz, More than 6 A

Dimensions (W x D x H): 670 x 640 x 570 mm (26.4" x 25.2" x 22.4")
Without options

Weight: 63 kg (138.9 lb)

Power Consumption: Mainframe only:
- 115 V/230 V machine -

Maximum	Less than 1.2 kW
Warm-up	Less than 1.0 kW
Energy Saver Mode	Less than 40 W/h

Noise Emission:

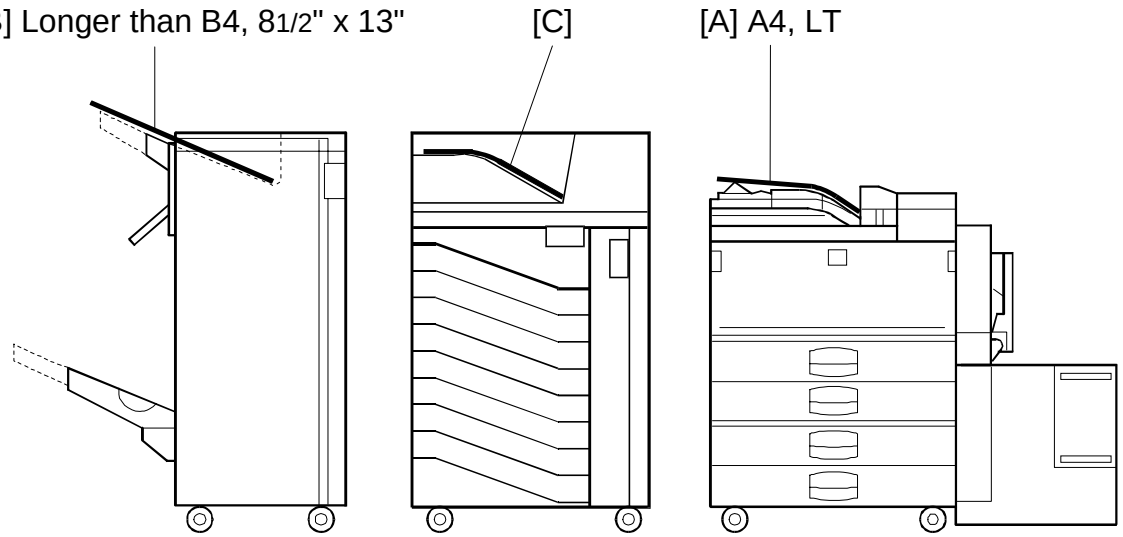
	Mainframe Only	**System**
Sound Power Level		
Printing	70 dB(A)	74 dB(A)
Stand-by	42 dB(A)	—

NOTE: The above measurements were made in accordance with ISO 7779.

1.1.2 NETWORK INTERFACE BOARD

Type:	Internal Network Interface Board
Network Topology:	Ethernet (10 base-T) and Fast Ethernet (100 base-TX)
Network Interface:	RJ45 x 1
Protocols:	IPX, TCP/IP, EtherTalk
SNMP Support:	• IP and IPX SNMP support of MIB-2 and proprietary NIC MIB. • SNMP support of standard MIB and proprietary printer MIBs on compatible printers.
Required Cable:	STP (Shielded Twisted-Pair) cable Category/Type 5 or better **NOTE:** A cable is not enclosed with this option.
Utility Software:	• MAP (Management Access Protocol) • IPX peer-to-peer printing • IP peer-to-peer printing • BOOTP (16-bit and 32-bit) • NetWare setup utility
Other:	• Built-in web server • Built-in Telnet server • Firmware update over an IPX or IP network

1.2 PAPER EXIT TRAY SELECTION



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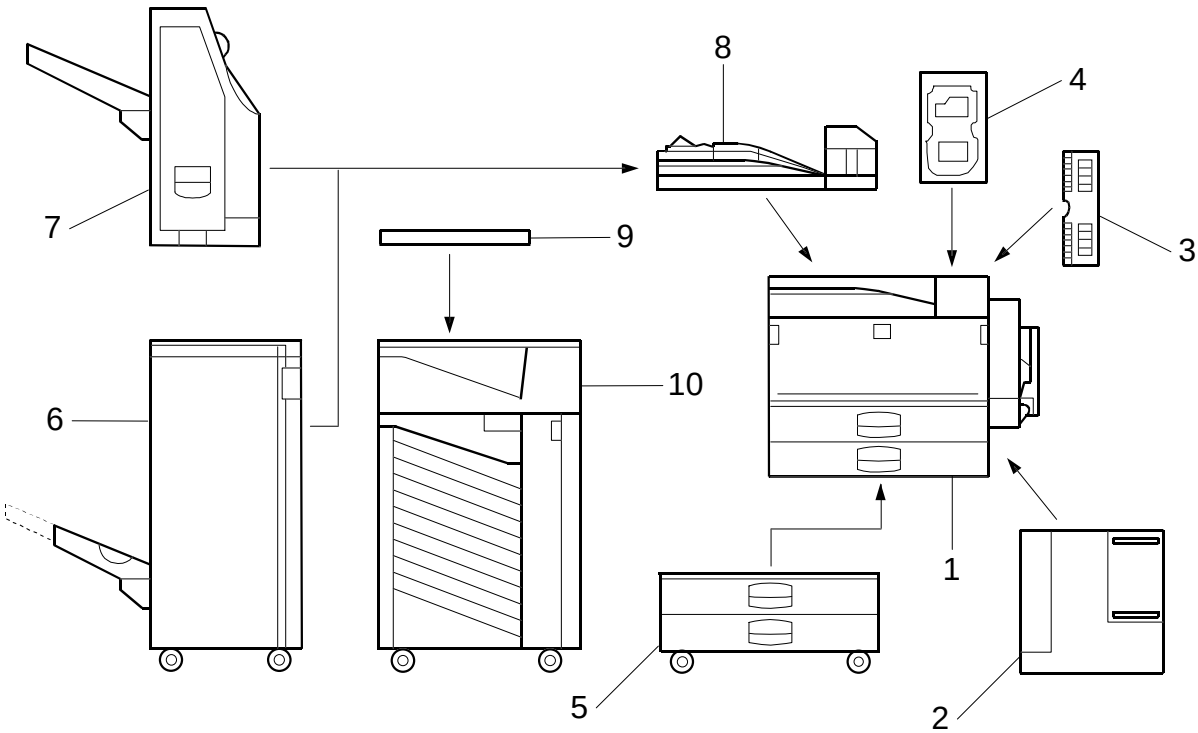
The machine allows selection between the paper tray exit trays: Internal Tray [A] (standard output tray), External Tray [B] (finisher) and [C] (mail box). If the sub-scan length is more than 330 mm, the exit tray is as shown below, if the relevant options have been installed.

Installed options	Exit tray for paper longer than 330 mm
Bridge unit & Finisher (1,000-sheet)	Internal Tray [A]
Bridge unit & Finisher (3,000-sheet)	External Tray [B]: The finisher upper tray
Bridge unit and Mailbox	[C]: The mail box tray
Bridge unit and Mailbox and Finisher 3000	[C]: The mail box tray

1.3 MACHINE CONFIGURATION

1.3.1 SYSTEM COMPONENTS



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Version	Item	Machine Code	No.
Printer	Printer	G035	1
	LCT (Option)	A683	2
	RAM SIMM (Option)	—	3
	Hard Disk (Option)	A853	4
	Paper Tray Unit (Option)	G520	5
	3,000-sheet Finisher (Option)	A697	6
	1,000-sheet Finisher (Option)	A681	7
	Bridge Unit (Option)	A688	8
	Mailbox Bridge Unit (Option)	G912	9
	Mailbox (Option)	G909	10
	Punch Unit (Option for 3000-sheet Finisher)	A812-17 (3 holes) A812-27 (2 holes)	

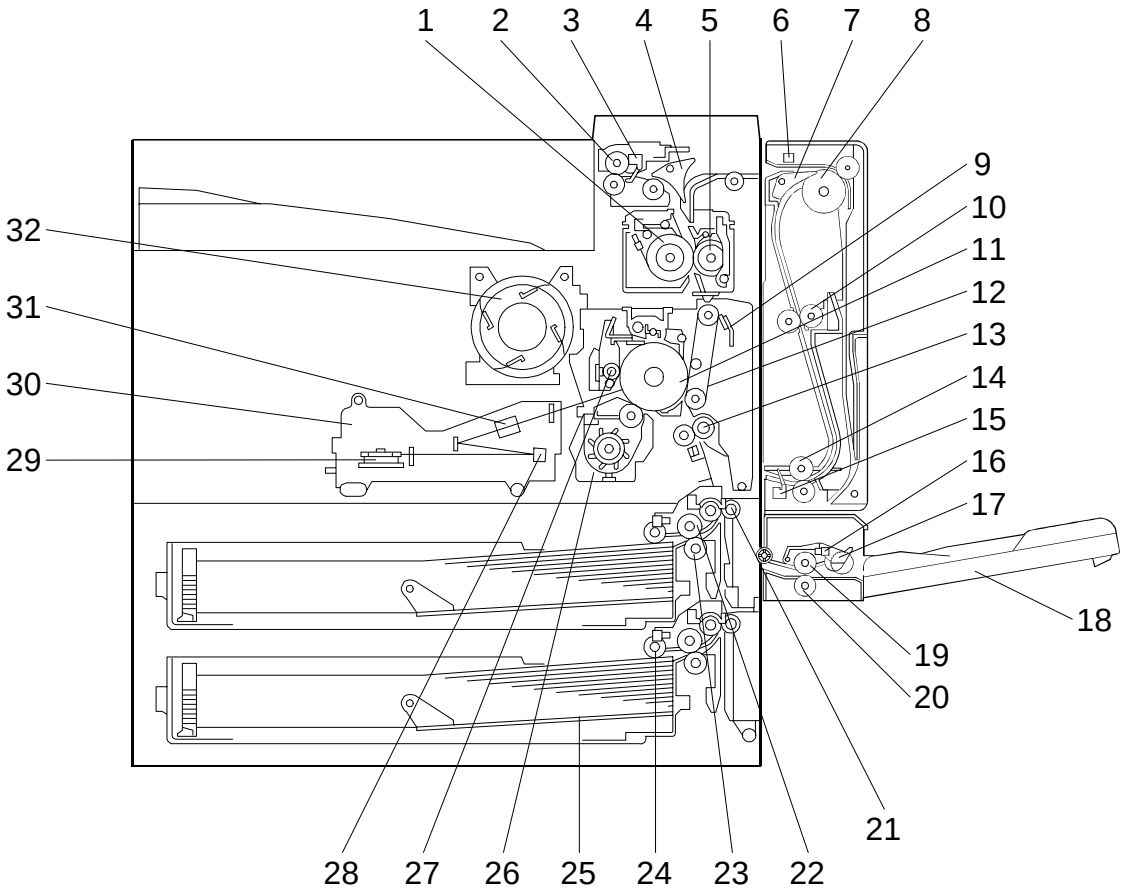
1.3.2 INSTALLABLE OPTION TABLE

Printer Options

❍ = Standard ● = Available ▲ = Requires another option

Option		Note
Paper Tray Unit	●	
LCT	▲	Requires the paper tray unit.
By-pass Feed Unit	❍	
Duplex Unit	❍	
Bridge Unit	●	
1,000-sheet Finisher	▲	Requires the paper tray unit and bridge unit.
3,000-sheet Finisher	▲	Requires the paper tray unit and bridge unit.
Punch Unit	▲	Requires the 3000-sheet finisher.
Mailbox	▲	Requires the bridge unit and the paper tray unit
Mailbox Bridge Unit	▲	Requires the Mailbox

1.4 MECHANICAL COMPONENT LAYOUT



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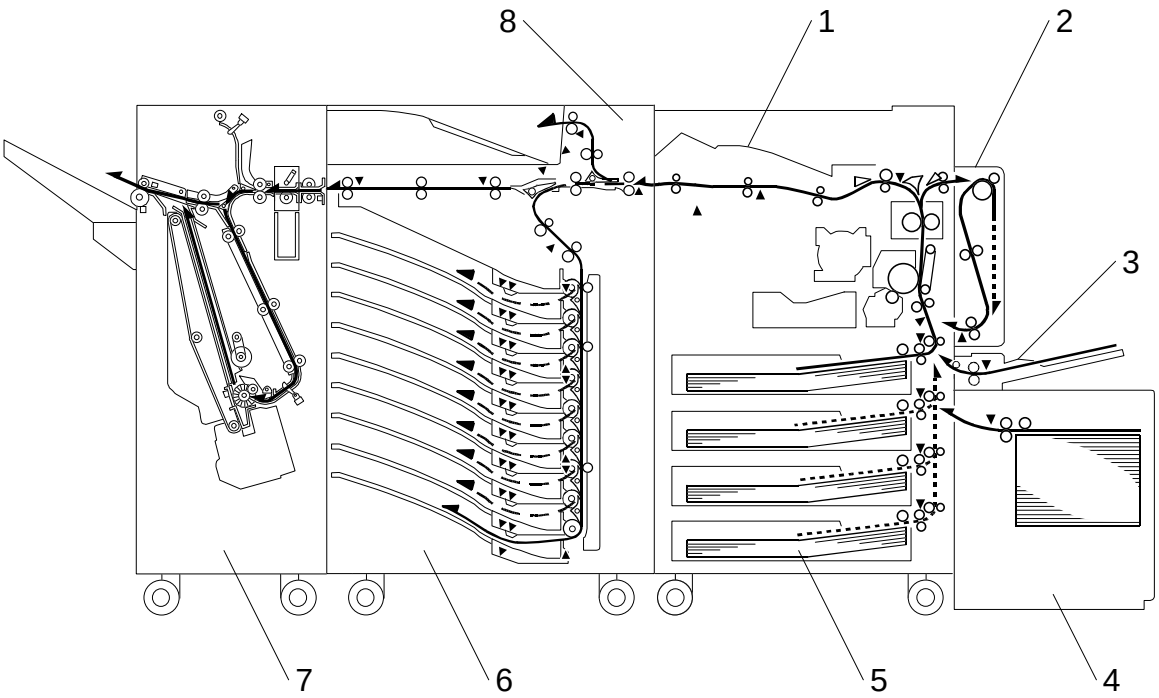
1. Hot roller
2. Exit roller
3. Paper exit sensor
4. Exit junction gate
5. Pressure roller
6. Entrance sensor
7. Inverter gate
8. Inverter roller
9. Transfer belt cleaning blade
10. Upper transport roller
11. OPC drum
12. Transfer belt
13. Registration roller
14. Lower transport roller
15. Exit sensor
16. Paper end sensor
17. Pick-up roller
18. By-pass tray
19. Paper feed roller
20. Separation roller
21. Upper relay rollers
22. Feed roller
23. Separation roller
24. Pick-up roller
25. Bottom plate
26. Development unit
27. Charge roller
28. Fθ mirror
29. Polygonal mirror motor
30. Laser unit
31. Barrel toroidal lens (BTL)
32. Toner supply bottle holder

1.5 PAPER PATH



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1. Bridge unit
2. Duplex unit
3. By-pass feed unit
4. LCT
5. Paper tray unit
6. Mailbox
7. 3,000-sheet finisher
8. Mailbox bridge unit

1.6 ELECTRICAL COMPONENT DESCRIPTIONS

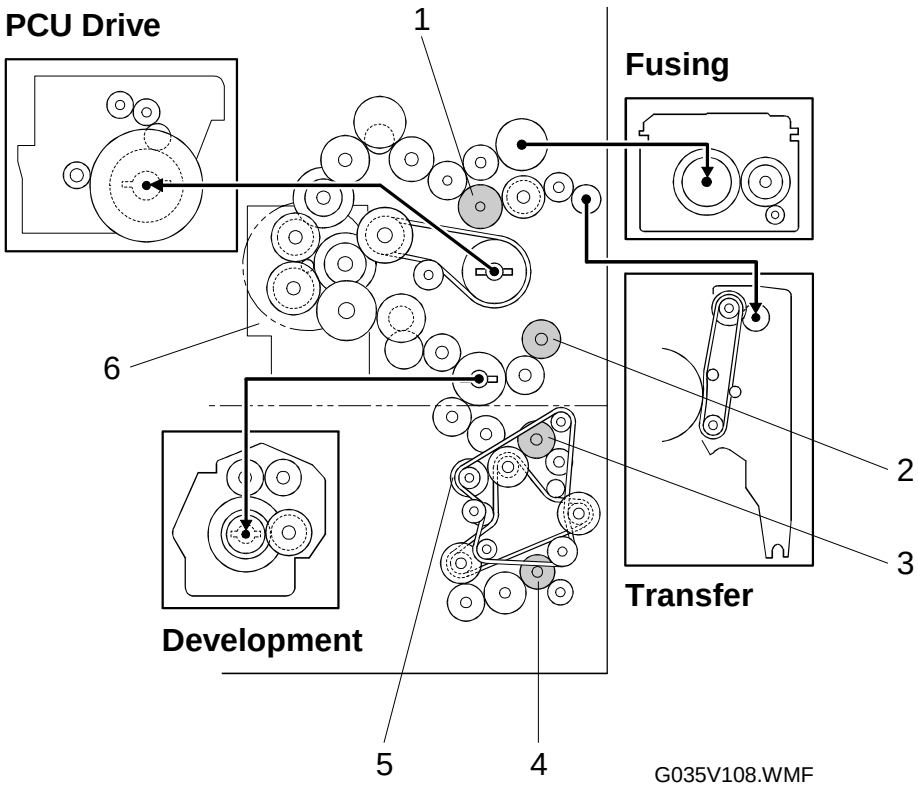
Refer to the electrical component layout and the point-to-point diagram on the waterproof paper in the pocket for the locations of these components.

Symbol	Description	Note	Index No.
Printed Circuit Boards			
PCB1	Printer Controller	Controls the PC interface, print image processing, operation panel, and other controller options.	1
PCB2	Mother	Connects the controller to the BICU board.	2
PCB3	NIB (Network Interface Board)	Interfaces printer to the network.	3
PCB4	BICU (Base Engine & Image Control Unit)	Controls all printer engine functions both directly and through other control boards.	6
PCB5	IOB (Input/Output Board)	Controls the mechanical parts of the printer (excluding the paper feed section), and the fusing lamp power.	10
PCB6	PFB (Paper Feed Control)	Controls the mechanical parts of all paper feed sections.	9
PCB7	High Voltage Supply	Supplies high voltage to the drum charge roller, development roller, and transfer belt.	11
PCB8	PSU (Power Supply Unit)	Provides DC power to the system and AC power to the fusing.	7
PCB9	LDDR (Laser Diode Driver)	Controls the laser diode.	17
PCB10	Main (Duplex)	Controls the duplex unit.	60
Motors			
M1	Main	Drives the main body components.	25
M2	Tray Lift	Raises the bottom plate in the paper tray.	37
M3	Polygonal Mirror	Turns the polygonal mirror.	20
M4	LD Positioning	Rotates the LD unit to adjust the LD beam pitch when a different resolution is selected.	19
M5	Cooling Fan	Removes heat from the main PCBs.	26
M6	Exhaust Fan	Removes heat from around the fusing unit.	28
M7	Toner Supply	Rotates the toner bottle to supply toner to the development unit.	24
M8	PSU Cooling Fan	Removes heat from the PSU.	8
M9	Inverter (Duplex)	Drives the inverter roller.	59
M10	Transport (Duplex)	Drives the upper and lower transport rollers.	61
Sensors			
S1	LD Unit Home Position	Informs the CPU when the LD unit is at the home position.	18
S2	Toner Density (TD)	Detects the amount of toner inside the development unit.	15
S3	Paper Exit	Detects misfeeds.	46

Symbol	Description	Note	Index No.
S4	Registration	Detects the leading edge of the paper to determine the stop timing of the paper feed clutch, and detects misfeeds.	49
S5	Image Density (ID)	Detects the density of various patterns and the reflectivity of the drum for process control.	48
S6	Upper Paper Lift	Detects when the paper in the upper paper tray is at the feed height.	50
S7	Lower Paper Lift	Detects when the paper in the lower paper tray is at the feed height.	52
S8	Upper Paper End	Informs the CPU when the upper paper tray runs out of paper.	51
S9	Lower Paper End	Informs the CPU when the lower paper tray runs out of paper.	53
S10	Upper Relay	Detects misfeeds.	55
S11	Lower Relay	Detects misfeeds.	54
S12	Transfer Belt Position	Informs the CPU of the current position of the transfer belt unit.	29
S13	Toner Overflow	Detects toner overflow in the toner collection tank.	16
S14	Upper Paper Height 1	Detects the amount of paper in the upper tray in combination with upper paper height sensor 2.	41
S15	Upper Paper Height 2	Detects the amount of paper in the upper tray in combination with upper paper height sensor 1.	40
S16	Lower Paper Height 1	Detects the amount of paper in the lower tray by the in combination with lower paper height sensor 2.	39
S17	Lower Paper Height 2	Detects the amount of paper in the lower tray by the in combination with lower paper height sensor 1.	38
S18	New Unit Detection	Detects the new photoconductor and development unit.	31
S19	Entrance (Duplex)	Detects the trailing edge of the paper to turn on the inverter gate solenoid and turn on the inverter motor in reverse. Checks for misfeeds.	56
S20	Exit (By-pass)	Checks for misfeeds.	62
S21	Cover Guide	Detects whether the cover guide is opened.	63
S22	Paper End (By-pass)	Informs the copier when the by-pass tray runs out of paper.	64
S23	Paper Size Sensor Board (By-pass)	Detects the paper width.	67
Switches			
SW1	Right Lower Cover	Detects whether the right lower cover is open or closed.	35

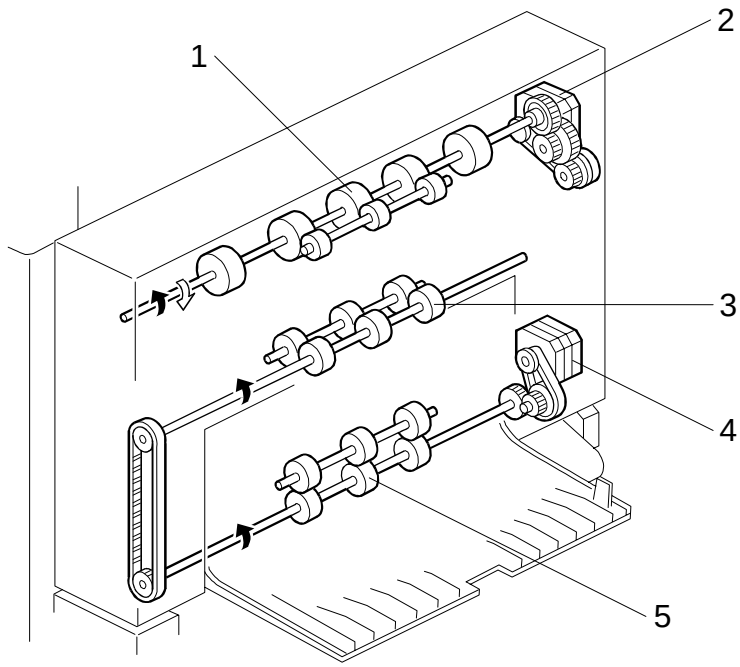
Symbol	Description	Note	Index No.
SW2	Right Upper Cover	Cut the +5VLD and +24 V DC power line and detects whether the right upper cover is open or closed.	22
SW3	Main Power	Supplies power to the printer. If this is off, there is no power supplied to the printer.	44
SW4	Front Cover Safety	Cuts the +5VLD and +24 V DC power line and detects whether the front cover is open.	45
SW5	Upper Paper Size	Determine the size of paper in the paper tray, based on the dial setting.	43
SW6	Lower Paper Size	Determine the size of paper in the paper tray, based on the dial setting.	42
SW7	Duplex Unit Open	Detects whether the duplex unit is opened.	57
Solenoids			
SOL1	Inverter Gate	Controls the inverter gate.	58
SOL2	Pick-up	Moves the pick-up roller to contact the paper.	66
SOL3	Duplex Junction Gate	Controls the duplex junction gate.	23
SOL4	Exit Junction Gate	Controls the exit junction gate.	27
Magnetic Clutches			
CL1	Transfer Belt	Controls the touch and release movement of the transfer belt unit.	30
CL2	Registration	Drives the registration rollers.	32
CL3	Relay	Drives the relay rollers.	34
CL4	Upper Paper Feed	Starts paper feed from the upper paper tray.	33
CL5	Lower Paper Feed	Starts paper feed from the lower paper tray.	36
CL6	Paper Feed (By-pass)	Starts paper feed from the by-pass tray.	65
Lamps			
L1	Fusing	Provides heat to the hot roller.	14
L2	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.	47
Thermistor			
TH1	Fusing	Monitors the temperature at the central area of the hot roller.	12
Thermofuse			
TF1	Fusing	Provides back up overheat protection in the fusing unit.	13
Other			
LSD	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.	21

1.7 DRIVE LAYOUT



1. Transfer belt clutch
2. Registration clutch
3. Upper paper feed clutch
4. Lower paper feed clutch
5. Relay clutch
6. Main motor

Duplex

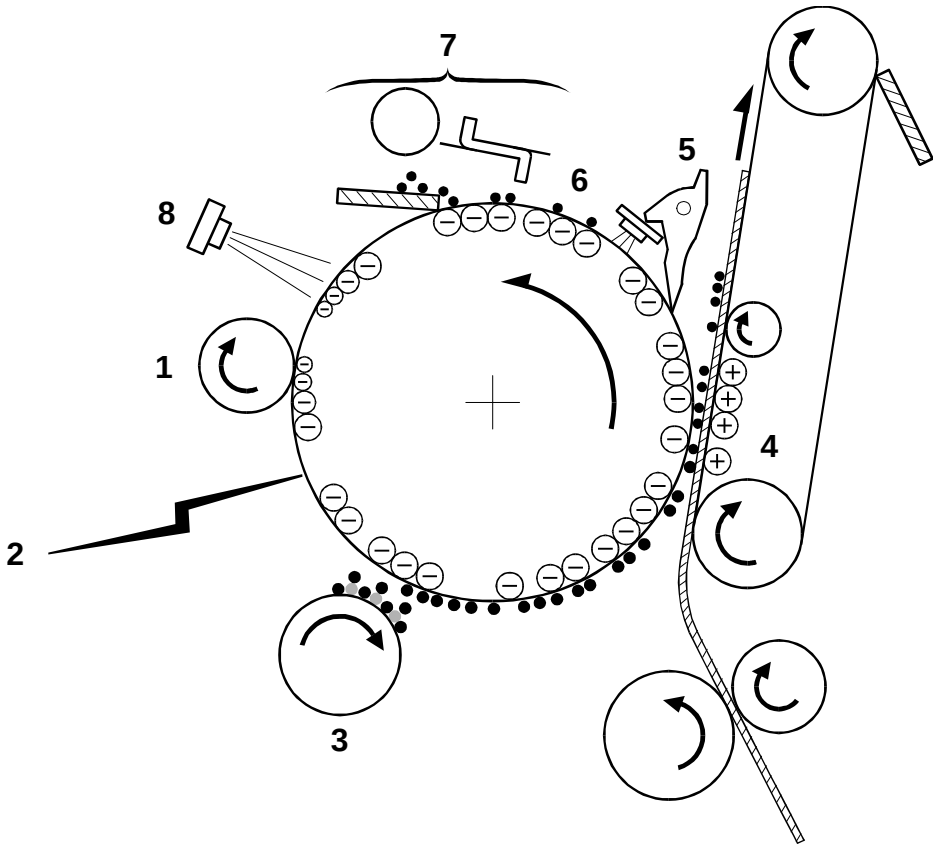


G035V002.WMF

1. Inverter roller
2. Inverter motor
3. Upper transport roller
4. Transport motor
5. Lower transport roller

1.8 PRINT PROCESS

1.8.1 OVERVIEW



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1. DRUM CHARGE

In the dark, the charge roller gives a negative charge to the organic photo-conductive (OPC) drum. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

2. LASER EXPOSURE

The processed data from the scanned original is retrieved from the memory and transferred to the drum by two laser beams, which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the BICU board.

3. DEVELOPMENT

The magnetic developer brush on the development roller comes in contact with the latent image on the drum surface. Toner particles are electrostatically attracted to the areas of the drum surface where the laser reduced the negative charge on the drum.

4. IMAGE TRANSFER

Paper is fed to the area between the drum surface and the transfer belt at the proper time to align the copy paper and the developed image on the drum surface. Then, the transfer bias roller applies a high positive charge to the reverse side of the paper through the transfer belt. This positive charge pulls the toner particles from the drum surface on to the paper. At the same time, the paper is electrically attracted to the transfer belt.

5. PAPER SEPARATION

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer belt. The pick-off pawls help separate the paper from the drum.

6. ID SENSOR

The laser forms a sensor pattern on the drum surface. The ID sensor measures the reflectivity of the pattern. The output signal is one of the factors used for toner supply control. Also, the ID sensor measures the reflectivity of the drum surface. The output signal is used for charge roller voltage control.

7. CLEANING

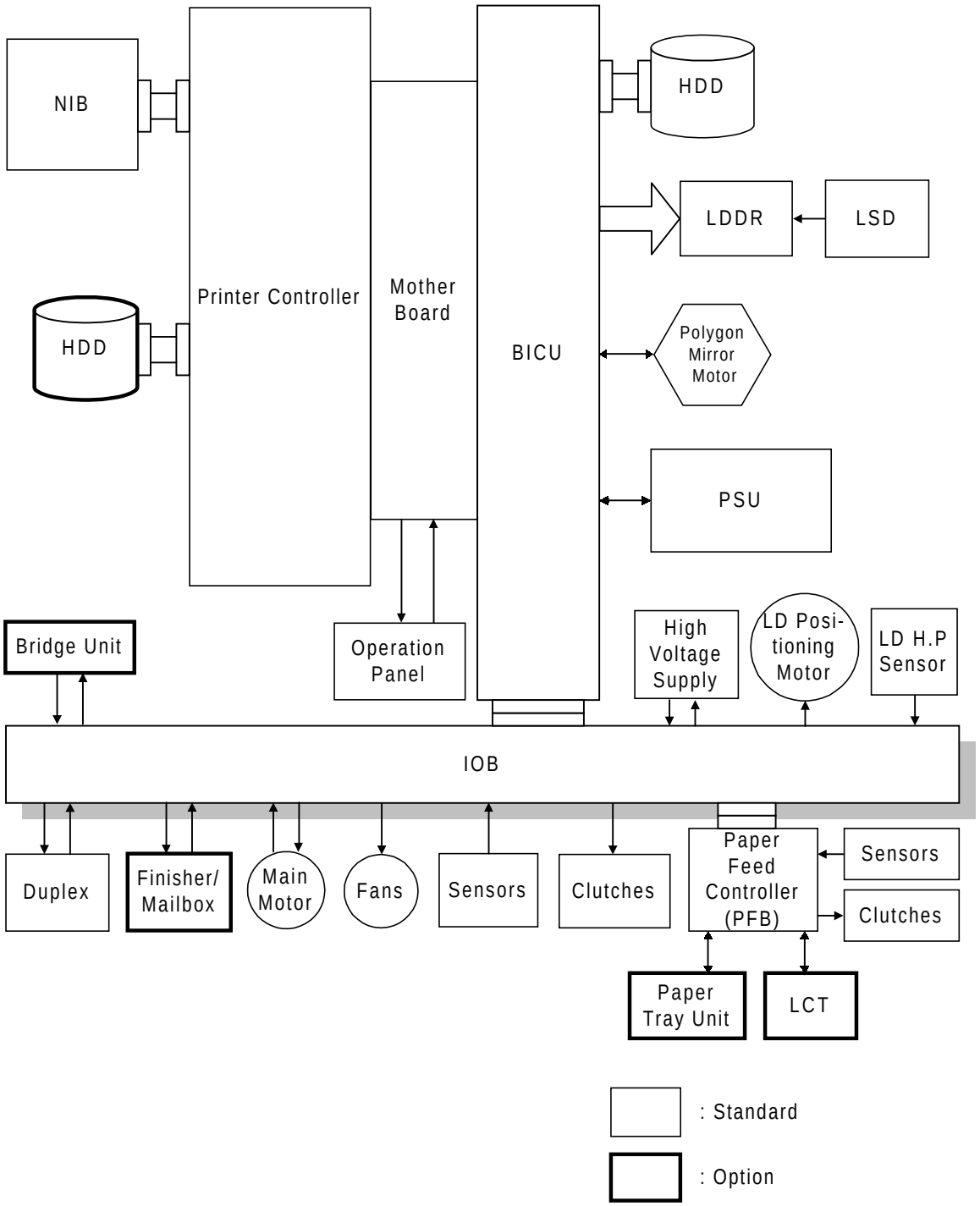
The drum cleaning blade removes any toner remaining on the drum surface after the image is transferred to the paper.

8. QUENCHING

The light from the quenching lamp electrically neutralizes the charge on the drum surface.

1.9 BOARD STRUCTURE

1.9.1 BLOCK DIAGRAM



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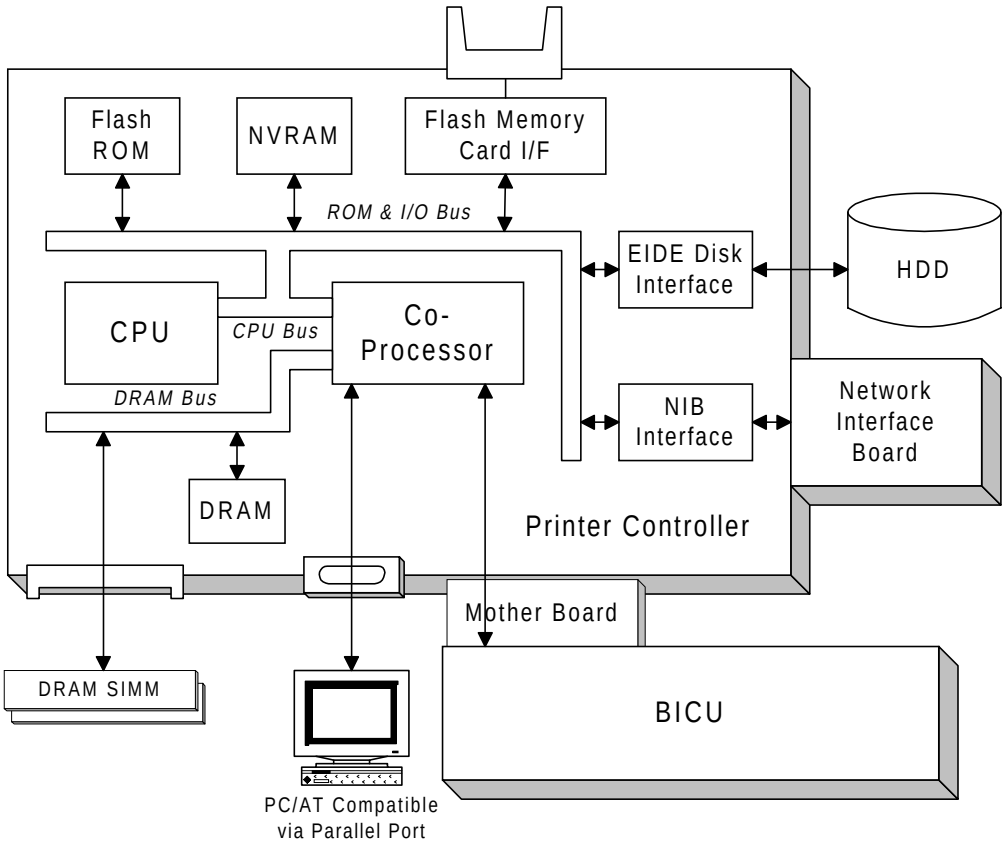
1.9.2 DESCRIPTIONS

1. **Printer Controller**
   The printer controller handles the following functions:
   - Printer host interface
   - Printing functions
   - Operation panel control
   - Interface and control of the network interface board
   - Interface and control of additional controller options (HDD and DRAM SIMM)
2. **Hard Disk (Option)**
   This HDD stores the additional soft fonts and macros (both PCL and PS fonts).
3. **Network Interface Board**
   The network interface board is a printer interface to allow the printer to be used on a network.
4. **DRAM SIMM (Option)**
   There are two DRAM SIMM slots. This is used for an additional printer processing memory area. 8, 16, or 32 Mbytes standard SIMM modules can be installed. As a result, up to 72 Mbytes of RAM are installable (8 Mbytes on board plus 64 Mbytes of optional SIMM).
5. **MB (Mother Board)**
   This connects the controller to the BICU board in the machine.
6. **BICU (Base Engine and Image Control Unit)**
   This is the main board. It controls the following functions.
   - Engine sequence
   - Timing control for peripherals
7. **IOB (Input/Output Board)**
   The IOB handles the following functions.
   - Drive control for the sensors, motors, and solenoids of the printer
   - PWM control for high voltage supply board
   - Serial interface with peripherals
   - Fusing control

2. DETAILED SECTION DESCRIPTIONS

2.1 PRINTER CONTROLLER

2.1.1 HARDWARE OVERVIEW



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The above block diagram shows the major components of the printer controller. The main features are as follows.

1. CPU

The CPU uses an IBM PPC603 processor. A 100-MHz oscillator is the clock source for both the CPU and the co-processor.

2. Co-processor

The co-processor performs the following functions.

- ROM control
- I/O control
- DRAM control
- Printer video interface
- Printer communication interface
- IEEE 1284 compliant bi-directional parallel port interface
- Interrupt control

3. **ROM memory**
   Flash ROM (8 MB)
   4 MB of flash ROM area is for boot, operation system, PCL5e, and PCL6 codes, and for the font data for both PCL languages (resident fonts). The remaining 4-MB area is for PostScript code and font data.

4. **NVRAM (8 KB)**
   This NVRAM contains the printer settings, and the job and error record data.

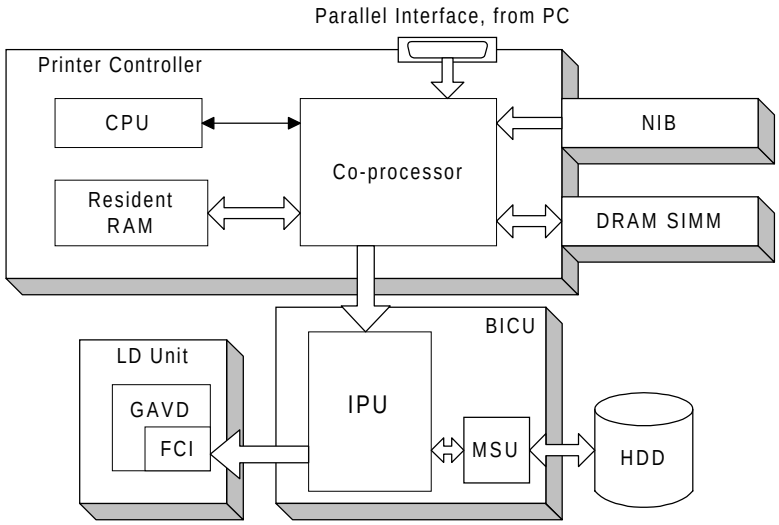
5. **Network Interface Board Interface**
   This interface controls the optional NIB, and a printer NIB is provided to support the network operations.

6. **Hard Disk Drive Interface (Enhanced IDE: Option)**
   This HDD interface is provided to support storage of fonts and macros downloaded from a PC.

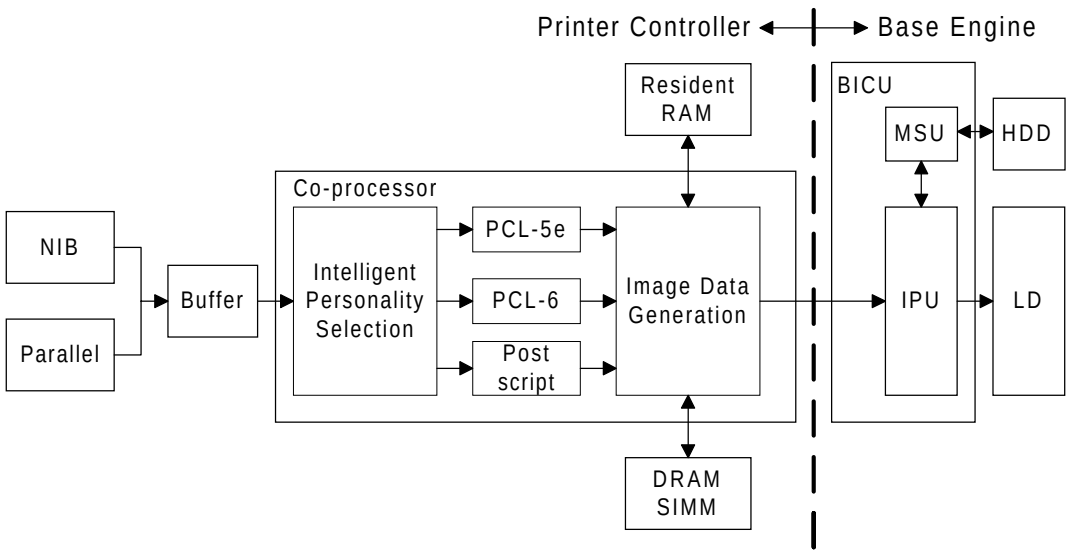
7. **IC Card Interface**
   The flash memory card for updating the controller and PostScript firmware is connected to this flash memory card slot.

8. **Power-on Self-diagnostic**
   When the controller is turned on, the controller performs a self-diagnostic test.

2.1.2 IMAGE PRINTING



G035D552.WMF



G035D553.WMF

The printer controller receives the print data from the computer through the parallel or network interface port. The co-processor handles the image data but it only makes a raster image. All image processing, such as edge smoothing and toner saving, are done in the base engine.

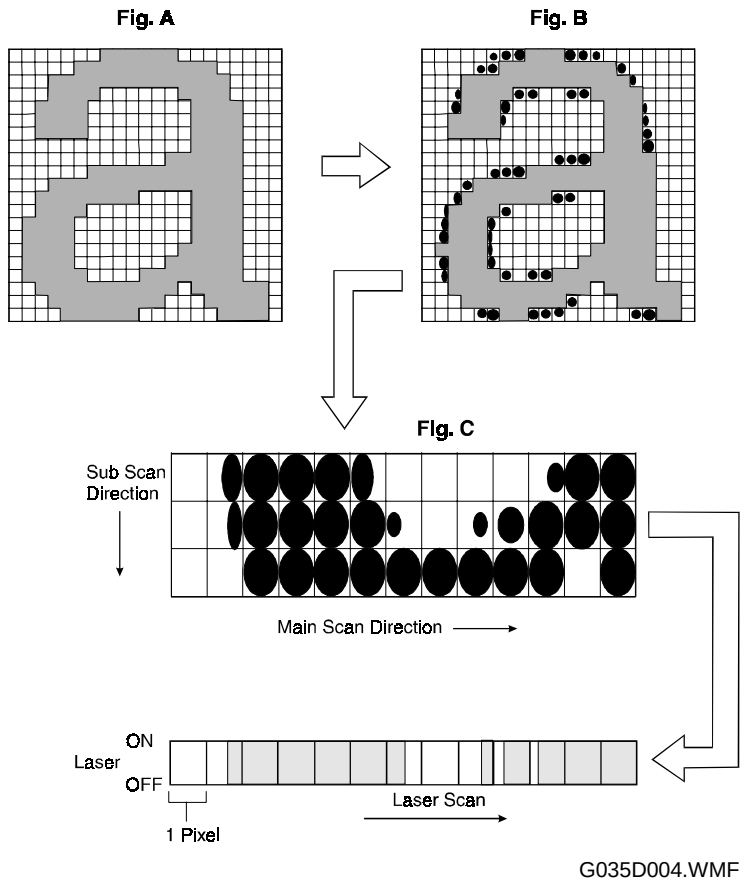
The image data from a PC goes to the buffer in the resident RAM. Then, it goes to the co-processor. The co-processor selects the printer language automatically, then it generates the print data to match the selected printer language. After generating the print data, the co-processor sends it to the LD unit through the IPU on the BICU board. At that time, the data is also sent to the hard disk for multiple printing and sorting, as well as backup in case of paper jams.

2.1.3 IMAGE DATA PROCESSING

The FCI in the LD unit is responsible for edge smoothing and toner saving functions.

The edge smoothing and toner saving modes can be switched on or off using the printer user tool or the printer driver.

Edge Smoothing



Usually, binary picture processing generates jagged edge on characters as shown in the above left illustration. The FCI reduces the edges of characters using edge smoothing.

Whether or not the object pixel undergoes smoothing depends on the surrounding image data. Changing the laser pulse position smoothes the object pixel.

Toner Saving Mode

Toner saving is done by reducing the laser power, not by varying the development bias. In toner saving mode, the image data is filtered through a matrix.

Passing through the filter uses less toner to create the latent image on the drum, and black areas print as gray.

2.1.4 FEATURES

Sorting

If “Collate” is turned on and a multi-print job is printed, the first sheet of the job will be printed directly. At the same time, the image data for the print job is stored in the hard disk of the machine. When the machine prints the next sheet, the next sheet will be printed from the hard disk.

If the finisher is not installed, the rotate sort feature can be used. The MSU rotates the image, in the same manner as image rotation for the printer.

Proof Print

The Proof Print function gives users a chance to check the print results before starting a multiple-set print run.

When printing from a host computer, a print job is sent to the controller with a user ID and the current time. Then the controller executes raster image processing, stores the image data onto the proof print partition of the hard disk on the machine, and prints one set of the document.

After the user checks that the print result is OK, the user selects the file using the machine’s operation panel, and print the rest of the sets. After all sets have been printed, the controller deletes the file automatically.

If the proof print result is not OK, the user must delete the file manually.

If there is no available space for a new file or a new page in the proof print partition, the machine displays the overflow status after receiving the new file or new page. The machine prints only one sheet of a file that was received during overflow status and generates error log information.

The error log information can be confirmed on the LCD using the user menu (Proof print – Show error log). The error log contains the user ID and time information. The machine can keep the latest 20 error logs. When the new error log is generated, the machine deletes the oldest error log.

NOTE: 1) The proof print partition size is about 720 MB. It can hold up to 30 files or about 965 pages. The maximum number of pages depends on how complex the pages are.
2) Proof print is available with PCL drivers, Windows 95/98 PostScript drivers, and Macintosh PostScript drivers (with the Proof Print plug-in). The PostScript drivers for Windows 3.x and Windows NT 4.0 do not support the proof print function.

Duplex Printing

Duplex printing is available with all output bin options but not all paper sizes (refer to the specifications section of the printer manual). If a job specifies duplex but the paper size in the duplex unit is not usable, the job will be print as simplex.

Duplex printing is available in two binding methods: Short- and Long-edge binding.

In short-edge binding, when printing the second side of a page, the image may require rotation. The co-processor in the printer controller rotates the image.

The co-processor corrects the image printing order for duplexing as follows.

- Larger than A4 lengthwise/LT lengthwise (example 8 pages)
  2nd page – 1st page – 4th page – 3rd page – 6th page – 5th page – 8th page – 7th page
- Up to A4 lengthwise/LT lengthwise (example 8 pages)
  2nd page – 4th page – 1st page – 6th page – 3rd page – 8th page – 5th page – 7th page

Stapling

Stapling is only available when the 3000-sheet finisher or 1000-sheet finisher is installed.

The finishers have the following stapling positions.

1) Upper left, diagonal
2) Upper right, diagonal
3) Left, two staples
4) Top, two staples
5) Right, two staples
6) Upper left, horizontal
7) Upper right, horizontal
8) Upper left, vertical
9) Upper right, vertical

NOTE: With the 1,000-sheet finisher, only stapling positions 1) and 2) are available.

Depending on the paper orientation, the image may have to be rotated. The co-processor in the printer controller does this image rotation.

There is a limit for the number of sheets that each finisher can stapled. If a job that specifies stapling has more than this number of sheets, it will not be stapled.

Punching

Punching is only available when the punch unit is installed with the 3,000-sheet finisher. The number of holes depends on the type of punching unit. The punching unit has only one available position, so the relationship between the punching position and the printed image depends on the paper feeding orientation and imaging. The punching positions are defined as follows.

1) Left
2) Top
3) Right

Jam Recovery

If the jam recovery feature is on and a paper jam occurs, the controller will reprint all pages for which it did not receive a feed-out indication from the main machine. In most cases, all image data from the controller is saved on the HDD in the main machine. When a jam occurs, the recovery data is sent from the HDD in the main machine to the controller and printing continues after the jam is removed.

Auto Tray Select

After selecting “Auto Select” using the printer driver, the printer searches for a tray that contains the specified size of normal plain paper. The search starts from the LCT, and after finding a tray that contains the specified size of paper, the printer starts printing and feeds paper from that tray. The search sequence is as follows.

LCT – 1st tray – 2nd tray – 3rd tray – 4th tray – LCT

The default setting for the current tray is LCT. If the LCT is not installed, the default is the 1st tray.

Power On Self Diagnostics

When the controller turns on, it automatically performs a self-diagnostic sequence of tests. If any errors are detected, the operation panel displays an error message.

Test Items

Devices always tested

- Co-processor
- Flash ROM
- Resident RAM
- NVRAM
- Engine I/F
- Network interface board I/F

Devices tested when they are installed

- DRAM SIMM
- HDD I/F

2.1.5 HARD DISK

Two hard disks are used for the printer functions. One is connected to the printer controller (Printer HDD: Option), and the other to the BICU board in the machine (Engine HDD: Standard).

Printer HDD (Option)

When the main power switch is turned on after the printer HDD is installed, the machine asks you to format the hard disk.

If you press the “Yes” button, the machine formats the hard disk. At this time, two partitions will be made on the hard disk. One is for PCL and the other is for PostScript (fonts and macros only).

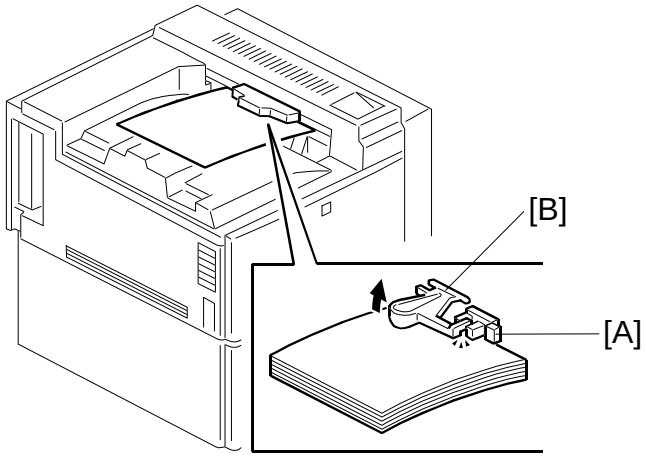
If you press the “Ignore” button, the machine determines that there is no optional printer hard disk.

Engine HDD (Standard)

The hard disk in the main machine, used for printer functions, has two partitions: for printer and proof print files.

2.1.6 PAPER OVERFLOW DETECTION

Standard Output Tray

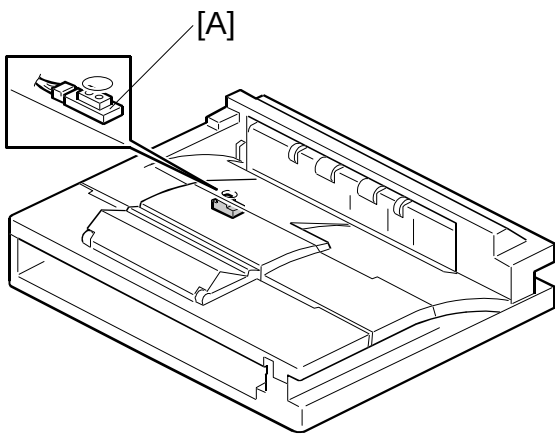


G035D007.WMF

The standard output tray can stack about 500 sheets. There is a paper limit sensor [A] to prevent paper overflow.

When the tray is full, the paper stack pushes up the feeler [B] then the paper limit sensor is activated. When the sensor stays activated for a certain time, the machine determines that the standard tray is full. The machine stops printing until the paper limit sensor is deactivated.

Bridge Unit



G035D008.WMF

The bridge unit has a paper sensor [A] to detect paper. This sensor is monitored to ensure that the bridge unit does not contain more than 250 sheets. If a print job of more than 250 sheets is executed, the machine will print up to 250 pages, then the print job stops. Once the output stack is removed, the printing job automatically continues from where it let off.

2.2 LASER EXPOSURE

2.2.1 OVERVIEW

This machine uses two laser diodes to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the BICU board into laser pulses, and the optical components direct these pulses to the drum.

To produce a high quality print image, these are 256 gradations for the laser pulses, controlled through power modulation (32 levels) and pulse width modulation (8 levels).

Exposure of the drum by the laser beam creates the latent image. The laser beam makes the main scan while drum rotation controls the sub scan.

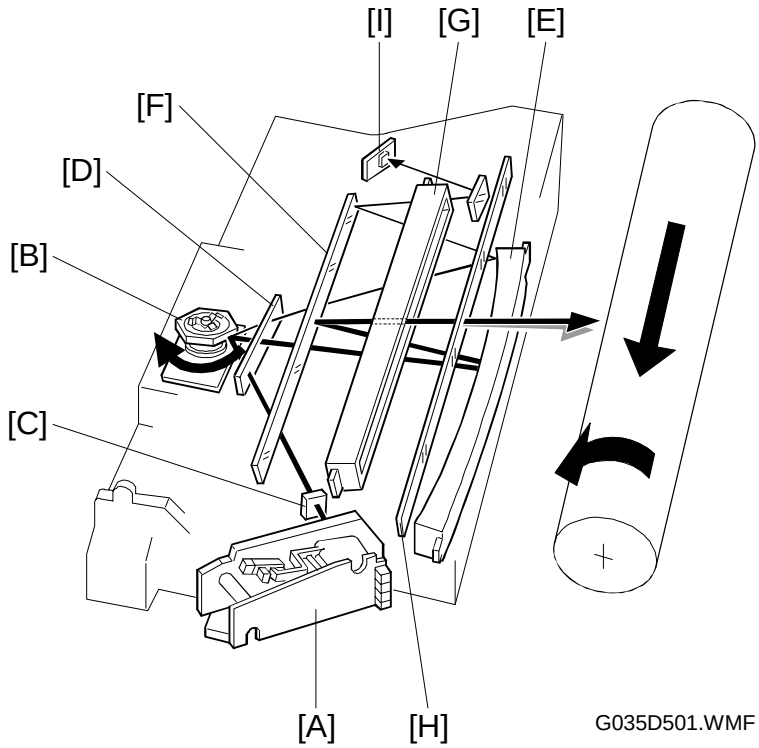
The combined strength of both beams is 0.430 mW on the drum surface at a wavelength of 780 nm.

The polygon motor speed is as follows.

Resolution	Motor Speed (rpm)	1 line cycle (μs)
400 dpi	Approx. 18110	276
600 dpi	Approx. 27170	184

In previous models, the mirror speed increased for higher resolutions. However, for this machine, the line cycle (time taken to output one main scan line of data to the laser diode) also varies, so a simple relationship does not exist between the resolution and the mirror speed.

2.2.2 OPTICAL PATH



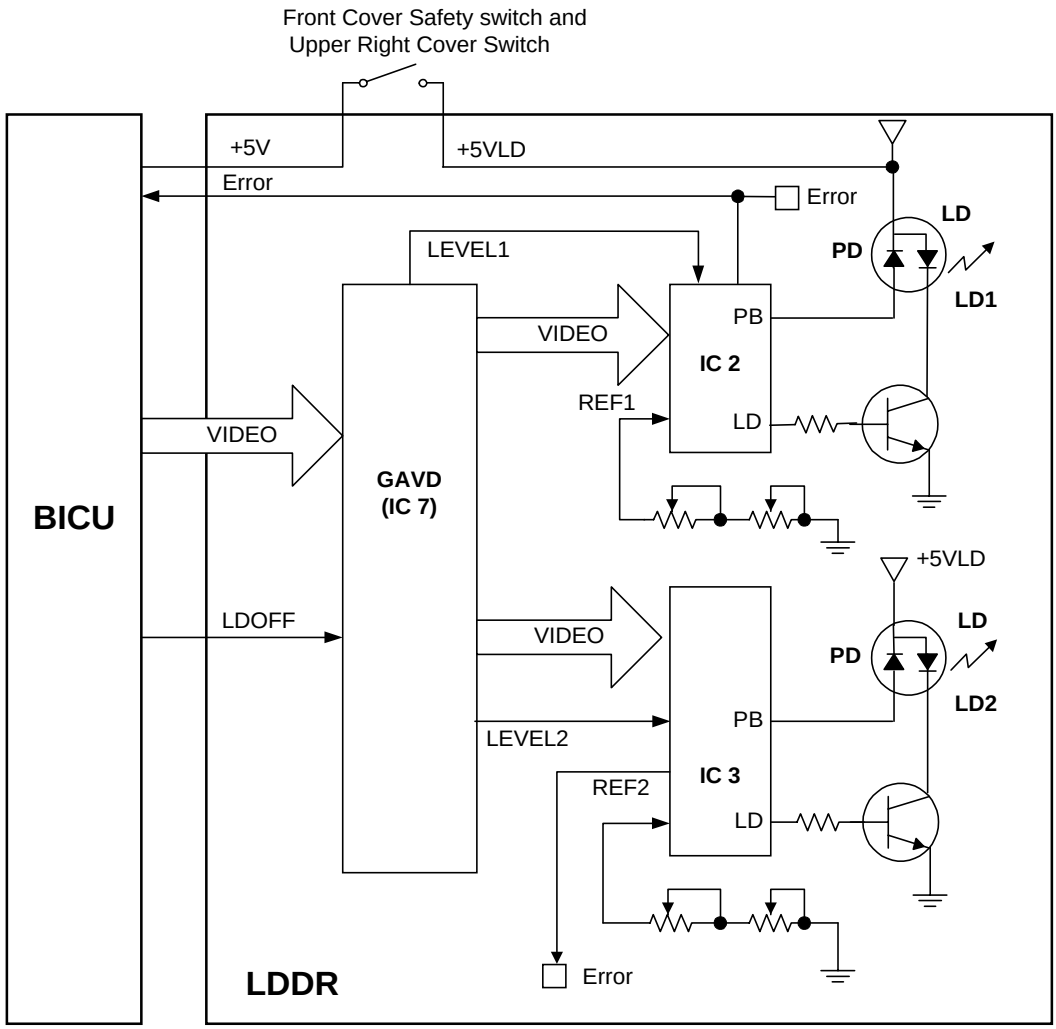
The output path from the laser diode to the drum is shown above.

The LD unit [A] outputs two laser beams to the polygon mirror [B] through the cylindrical lens [C] and the shield glass [D].

Each surface of the polygon mirror reflects two full main scan lines. The laser beams go to the F-theta mirror [E], mirror [F], and BTL (barrel toroidal lens) [G]. Then these laser beams go to the drum through the toner shield glass [H].

The laser synchronizing detector [I] determines the main scan starting position.

2.2.3 AUTO POWER CONTROL (APC)



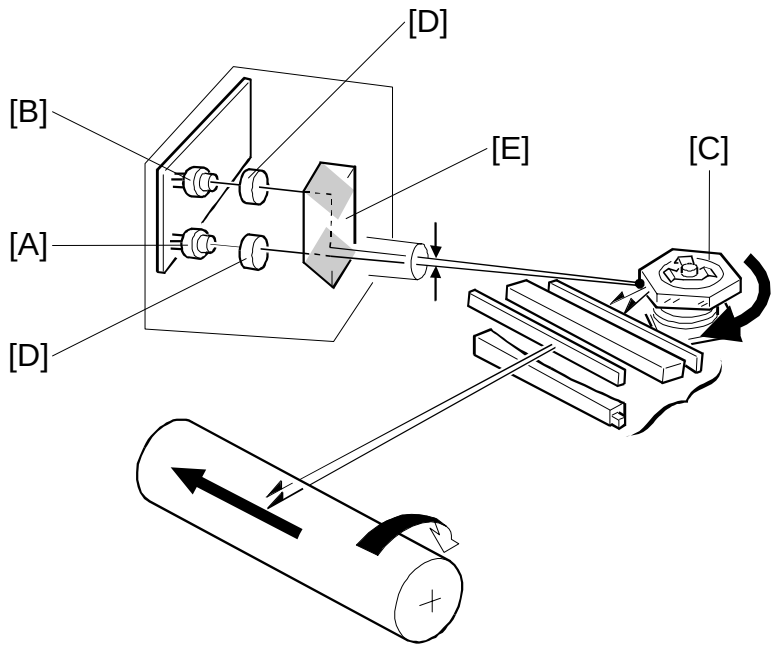
G035D502.WMF

IC2 and IC3 on the LDDR drive the laser diodes. Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

In order to keep the output level constant, IC2 and IC3 monitor the current passing through the photodiode (PD). Then they increase or decrease the current to the laser diode as necessary, comparing it with the reference levels (REF1 and REF2). This auto power control is done just after the machine is turned on and during printing while the laser diode is active.

The reference levels are adjusted on the production line. Do not touch the variable resistors on the LDDR in the field.

2.2.4 DUAL BEAM WRITING



G035D203.WMF

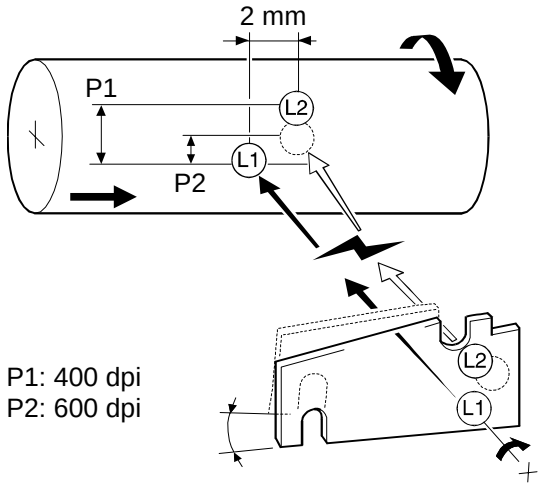
This LD unit has two laser diodes; LD1 [A] and LD2 [B] for writing the image. Each face of the polygon mirror writes two main scan lines, and twelve main scans are produced when the polygon mirror rotates once. The reasons for this mechanism are as follows.

1) To reduce the polygon mirror motor rotation speed
2) To reduce the noise generated by the polygon mirror motor
3) To reduce the frequency of the image data clock

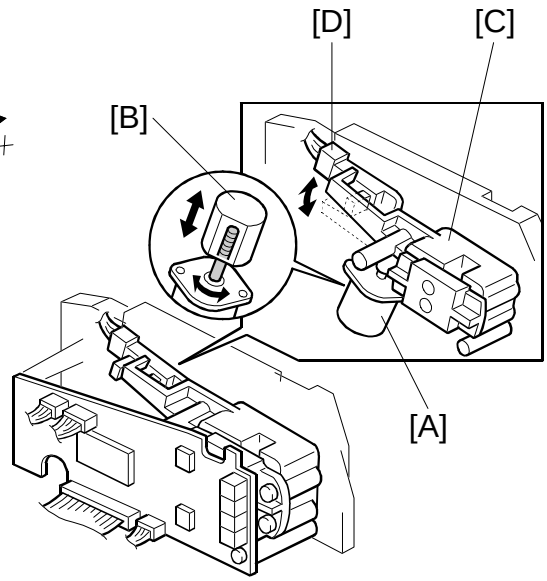
Two laser beams are transferred to the polygon mirror [C] through the collimating lens [D] and prism [E]. The two laser beams arrive on the drum surface about 2 mm away from each other in the main scan direction and about 0.06 mm (at 400 dpi) in the sub-scan direction (see the next page).

The reason for the two-mm difference in the main scan direction is so that the machine can detect a laser synchronization signal for each beam.

2.2.5 LASER BEAM PITCH CHANGE MECHANISM



G035D204.WMF



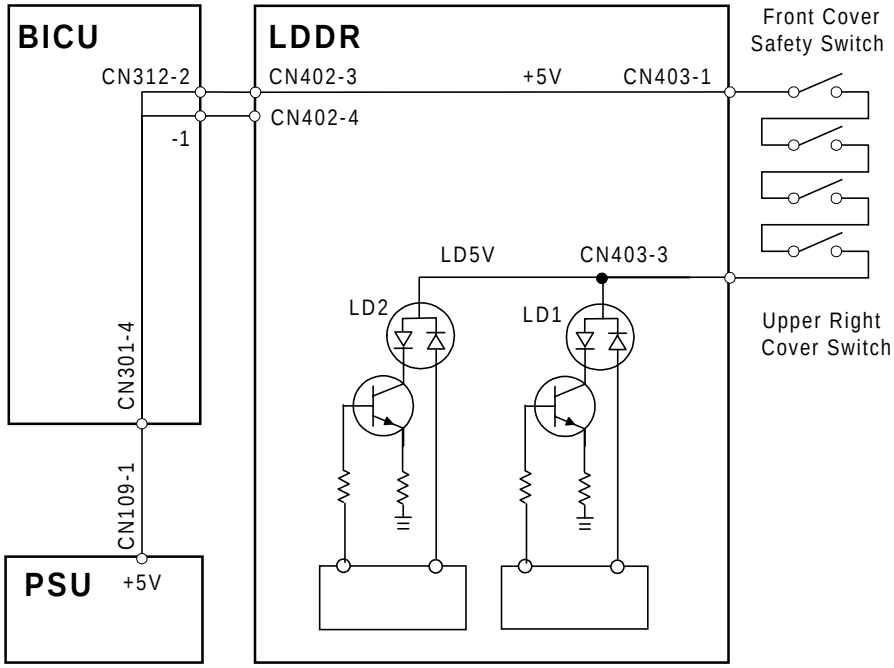
G035D503.WMF

The machine changes the resolution between 400 and 600 dpi by rotating the LD unit.

When the LD positioning motor [A] turns, the metal block [B] (in contact with the LD unit housing [C]) moves up and down. This changes the position of the L2 laser beam (L1 does not move).

Both LD unit positions are at fixed distances from the LD home position sensor [D] (measured by motor pulses). Usually, the LD unit moves directly to the proper position. However, when the number of times that the resolution has changed reaches 100 times, the LD unit moves to the home position (the home position sensor activates), and then it moves to the proper position. This recalibrates the LD unit positioning mechanism.

2.2.6 LD SAFETY SWITCHES



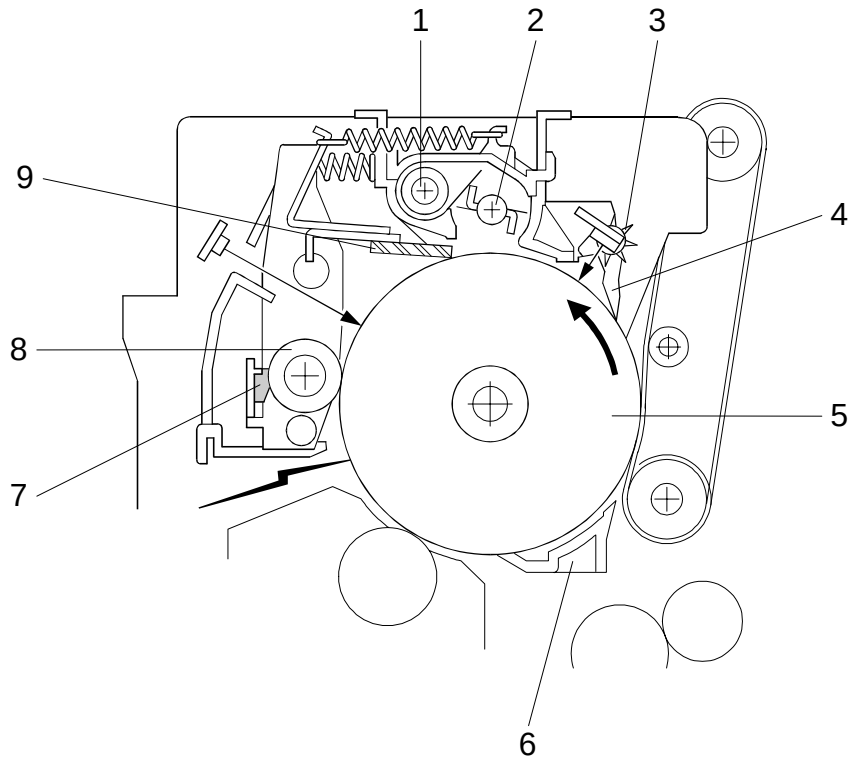
G035D560.WMF

To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during service maintenance, there are four safety switches located at the front and upper right covers. These four switches are in series on the LD5 V line that comes from the power supply unit (PSU) through the BICU board.

When opening either the front or upper right covers, the power supply to the laser diode is interrupted.

2.3 PHOTOCONDUCTOR UNIT (PCU)

2.3.1 OVERVIEW

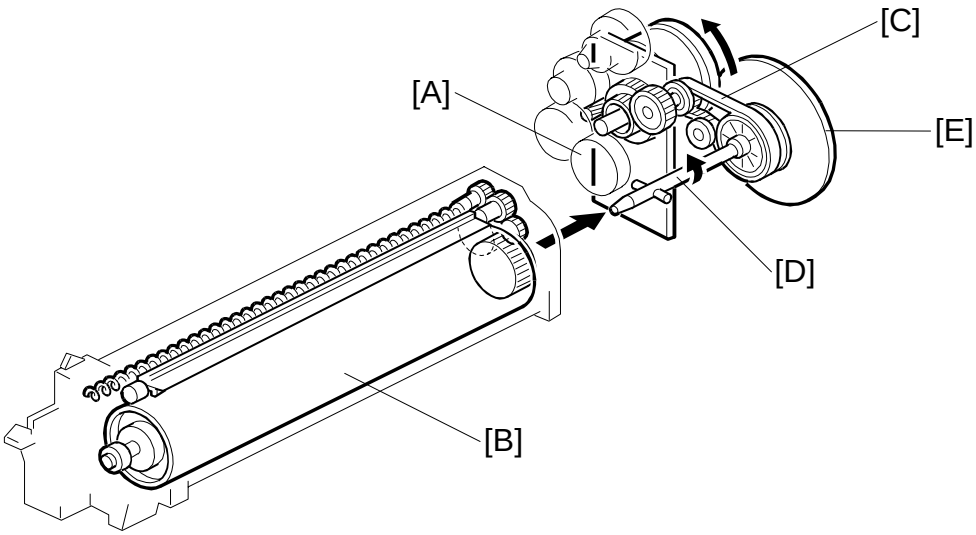


G035D301.WMF

The PCU consists of the components shown in the above illustration. An organic photoconductor (OPC) drum (diameter: 60 mm) is used in this machine.

1. Toner Collection Coil
2. Toner Collection Plate
3. ID Sensor
4. Spur
5. Pick off Pawl
6. OPC Drum
7. Transfer Entrance Guide
8. Charge Roller Cleaning Pad
9. Charge Roller
10. Cleaning Blade

2.3.2 DRIVE MECHANISM



G035D302.WMF

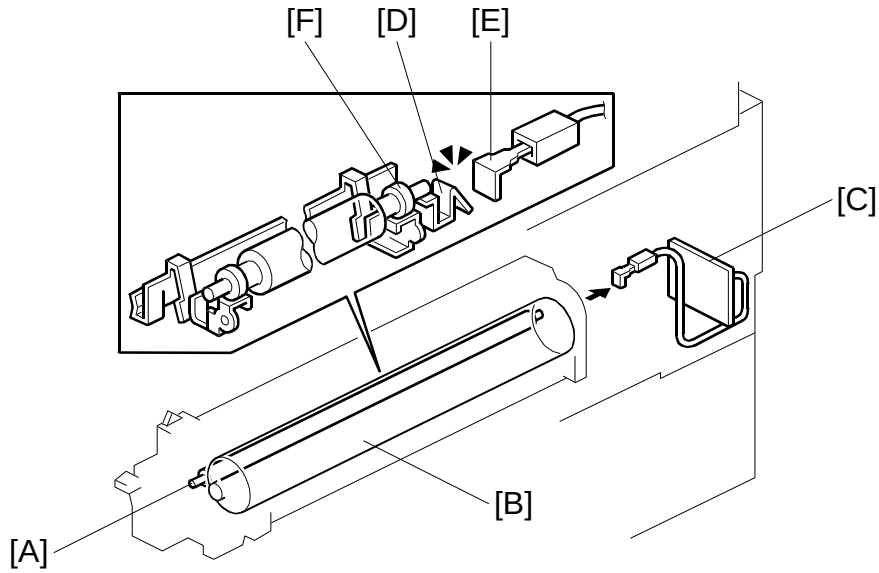
The drive from the main motor [A] is transmitted to the drum [B] through a series of gears, a timing belt [C], and the drum drive shaft [D]. The main motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

The flywheel [E] on the end of the drum drive shaft stabilizes the rotation speed preventing banding and jitters from appearing on sheets printed.

This machine has two flywheels because it operates at a higher speed.

2.4 DRUM CHARGE

2.4.1 OVERVIEW



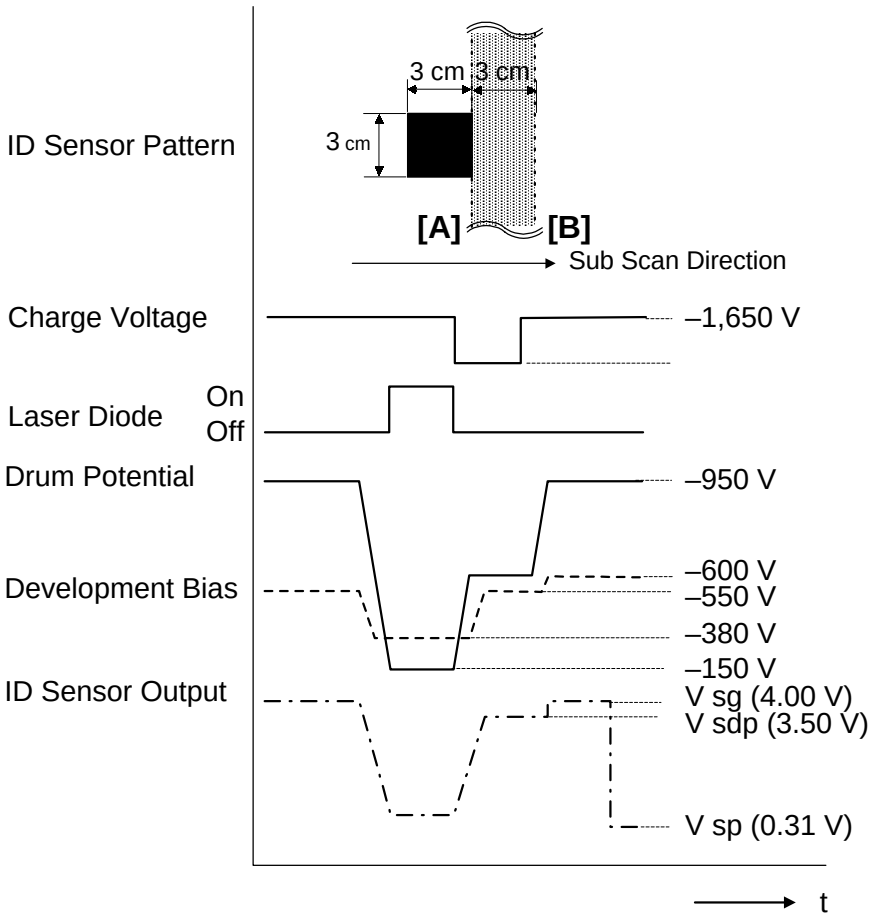
G035D525.WMF

This printer uses a drum charge roller instead of a scorotron corona wire to charge the drum. The drum charge roller [A] is always in contact with the surface of the drum [B] to give it a negative charge.

The high voltage supply board [C] gives a negative DC voltage to the drum charge roller through the charge roller terminal [D], bias plate [E], and the rear roller bushing [F]. This gives the drum surface a negative charge of –950 V.

2.4.2 CHARGE ROLLER VOLTAGE CORRECTION

Correction for Environmental Conditions



G035D506.WMF

In the drum charge roller system, the voltage transferred from roller to drum varies with the temperature and humidity around the drum charge roller. The lower the temperature or humidity is, the higher the applied voltage required.

To compensate, the machine uses the ID sensor to measure the effects of current environmental conditions. For this measurement, the process control parameters are balanced so that any small change in drum potential caused by environmental effects is reflected in a change in the amount of toner transferred to the drum.

This measurement is made immediately after the ID sensor pattern for toner density control is made. Immediately after making the ID sensor pattern [A], the charge roller voltage drops reducing the drum potential to –600 V. At the same time, the development bias returns to –550 V. The drum potential is now slightly higher than the development bias, so only a very small amount of toner transfers to the drum. The ID sensor measures the density of this pattern [B], and the output voltage is known as Vsdp. This voltage is comparable to Vsg (read from the bare drum at the same time).

If the humidity drops, the drum potential goes up even if the voltage supply for the charge roller remains the same (efficiency of voltage transfer decreases with increased humidity). As a result, more toner is transferred to the ID sensor pattern [B]. If the sensor output reaches a certain point, the drum charge voltage is reduced.
To determine whether to change the drum charge roller voltage, the machine compares Vsdp with Vsg.

- Vsdp/Vsg > 0.90 = Reduce the drum charge voltage by 30 V
- Vsdp/Vsg < 0.85 = Increase the drum charge voltage by 30 V

NOTE: The minimum drum charge roller voltage is –2 kV.

Correction for Paper Width and Thickness (By-pass Tray Only)

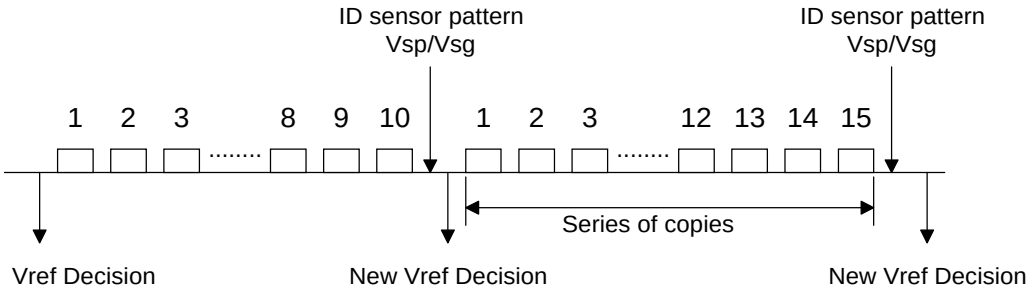
The by-pass tray can feed narrow, thick and special paper types (OHPs) that the standard tray can not. If you use the standard tray with these special paper types, some print quality problems may occur.

To deal with this, the charge roller receives a higher voltage for when using paper fed from the by-pass tray. Adjust the voltage with SP2-13-1 and 2. Charge roller input voltages

Paper width from 216 mm to 297 mm: SP2-5-1
Paper width from 150 mm to 216 mm: SP2-5-1 + 50 V (adj. with SP2-13-2)
Paper width below 150 mm: SP2-5-1 + 250 V (adj. with SP2-13-1)

Similar voltage adjustments are available for development bias and transfer current.

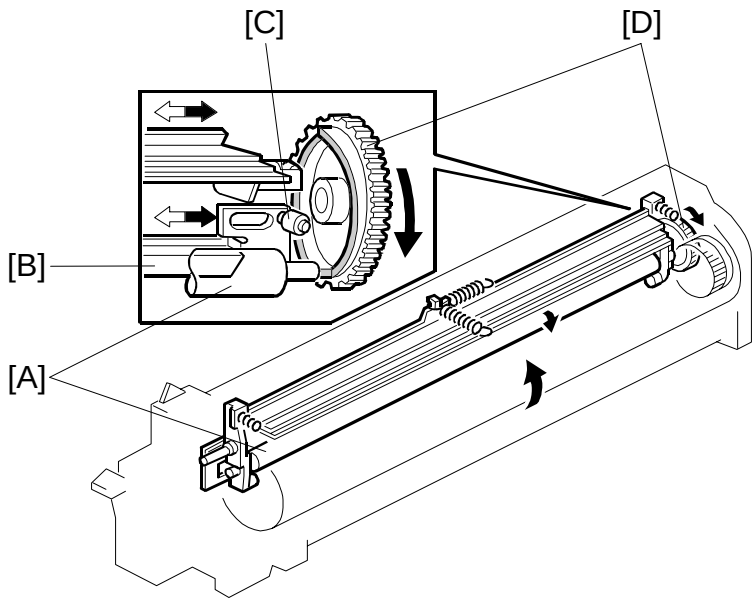
2.4.3 ID SENSOR PATTERN PRODUCTION TIMING



G035D535.WMF

An ID sensor pattern is made during machine initialization (after the main power switch or operation switch is turned on) and after finishing a print job in which 10 (this is the default value) or more sheets printed were made.

2.4.4 DRUM CHARGE ROLLER CLEANING



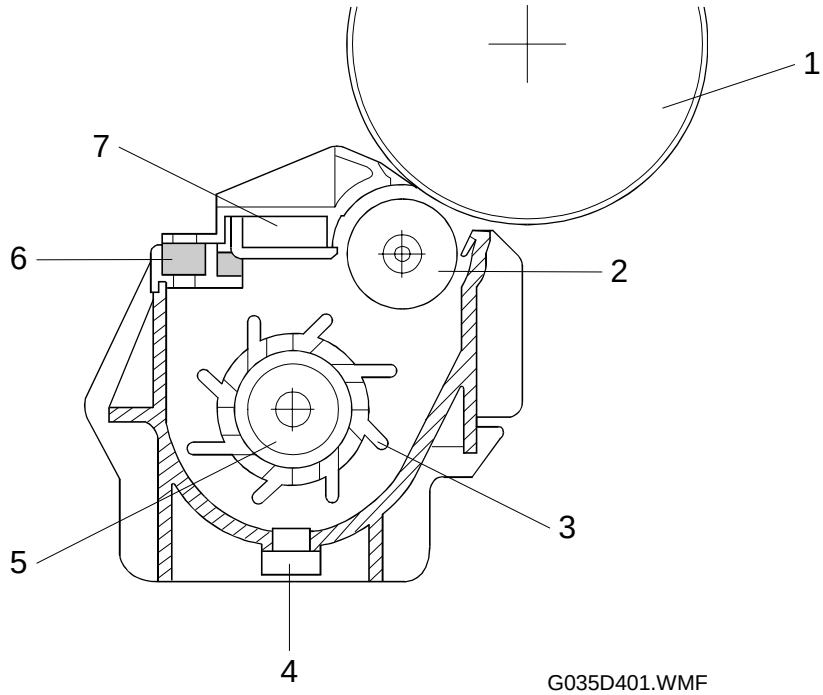
G035D303.WMF

The drum charge roller [A] gets dirty easily because it is always in contact with the drum. Therefore, the cleaning pad [B] is also always in contact with the drum charge roller to clean its surface.

The cam gear [C] moves the pin [D] at the rear of the cleaning pad holder, and also moves the cleaning pad from side to side. This movement improves the cleaning process.

2.5 DEVELOPMENT

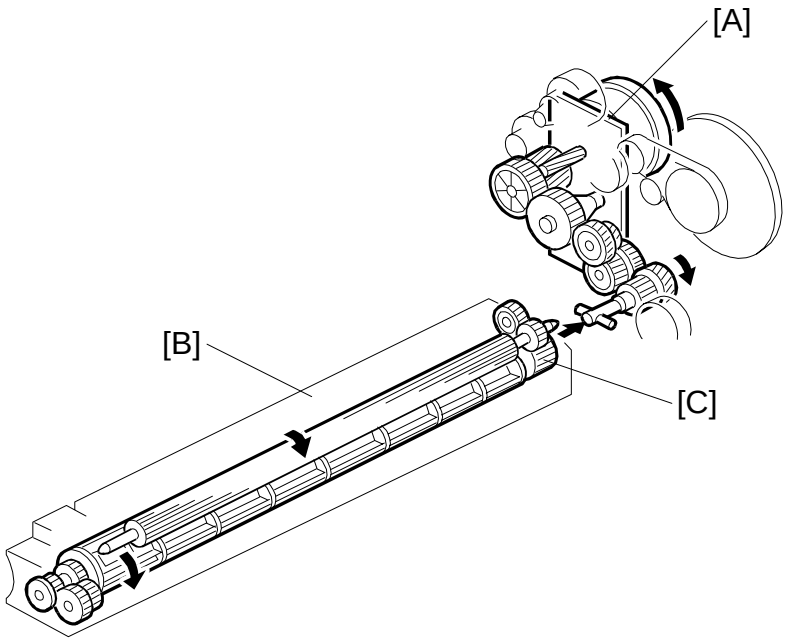
2.5.1 OVERVIEW



This machine uses a single-roller development system. A dual mixing roller mechanism is used for developer mixing.

1. Drum
2. Development Roller
3. Paddle Roller
4. TD Sensor
5. Mixing Auger
6. Development Filter
7. Doctoring Blade

2.5.2 DRIVE MECHANISM



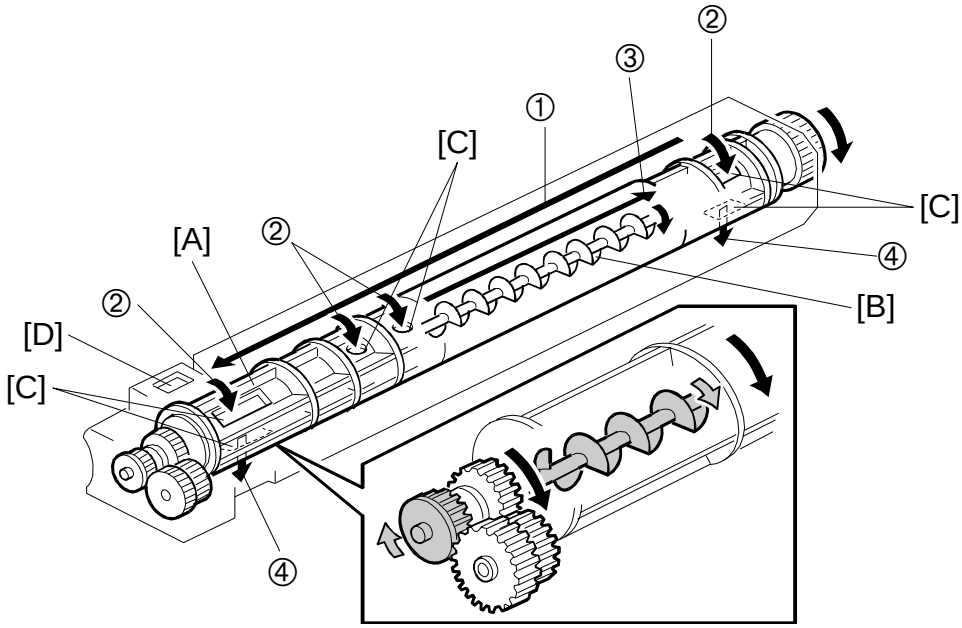
G035D402.WMF

The main motor [A] drives the development roller [B] through a train of gears and the paddle roller gear [C].

The development drive gears are helical, making them quieter than normal gears.

When the development unit is pushed in, the development drive shaft engages the paddle roller gear.

2.5.3 DEVELOPER MIXING



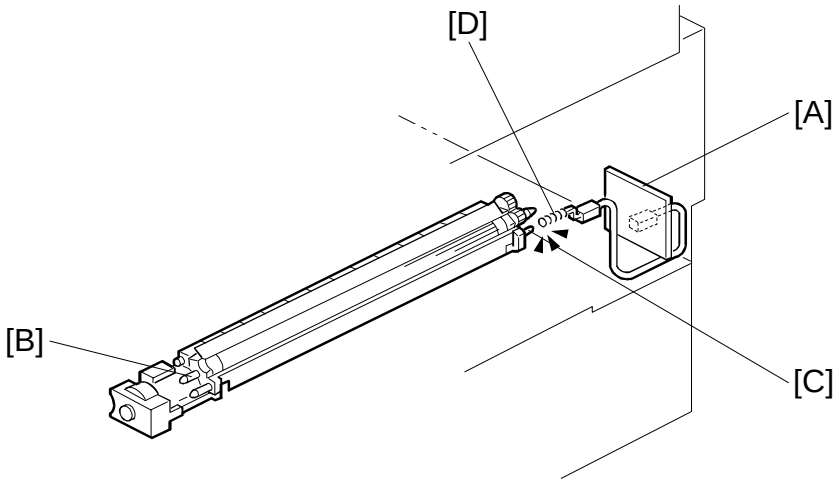
G035D403.WMF

This mechanism supplies toner from the toner bottle to the development roller.

The dual mixing roller consists of the outer paddle [A] and the inner auger [B]. The outer paddle moves developer to the front ① and supplies it to the development roller. The developer that is spilt off by the doctor blade ② goes through the holes [C] in the outer paddle, and is transported towards the rear ③ by the inner auger. While the dual mixing roller is moving the developer, some developer also goes back to the development unit through the holes in the bottom of the paddle roller ④.

New toner from the toner bottle and recycled toner from the toner collection coil both enter the development unit at the top [D]

2.5.4 DEVELOPMENT BIAS



G035D404.WMF

This machine uses a negative-positive development system, in which black areas of the latent image are at a low negative charge (about –150 V) and white areas are at a high negative charge (about –950 V).

To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board [A] applies a bias of -600 volts to the development roller throughout the image development process. The bias is applied to the development roller shaft [B] through the bias terminal spring [C] and bias terminal [D].

The development bias voltage (–600 V) can be adjusted with SP2-8.

Correction for Paper Width and Thickness (By-pass Tray Only)

The by-pass tray can feed narrow, thick and special paper types (OHPs) that the standard paper tray can not. If you use the standard tray with these special types of paper, some print quality problems may occur.

To deal with this, the charge roller receives a higher voltage for when using paper fed from the by-pass tray. Adjust the voltage with SP2-13-3 and 4.

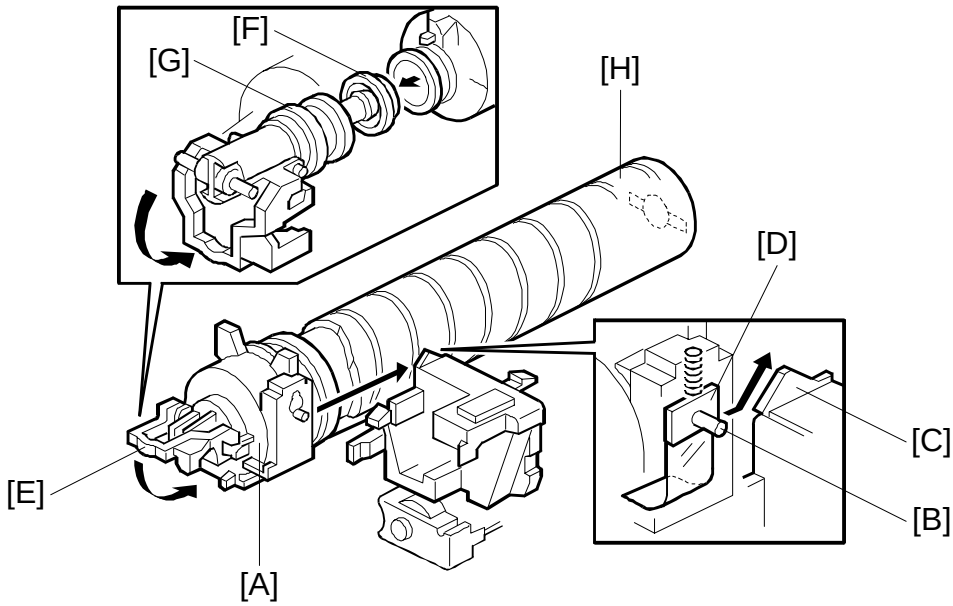
Development bias voltages

Paper width from 216 mm to 297 mm: SP2-5-1
Paper width from 150 mm to 216 mm: SP2-5-1 + 50 V (adj. with SP2-13-4)
Paper width below 150 mm: SP2-5-1 + 200 V (adj. with SP2-13-3)

Similar voltage adjustments are available for charge roller input voltage and transfer current.

2.5.5 TONER SUPPLY

Toner Bottle Replenishment Mechanism



G035D504.WMF

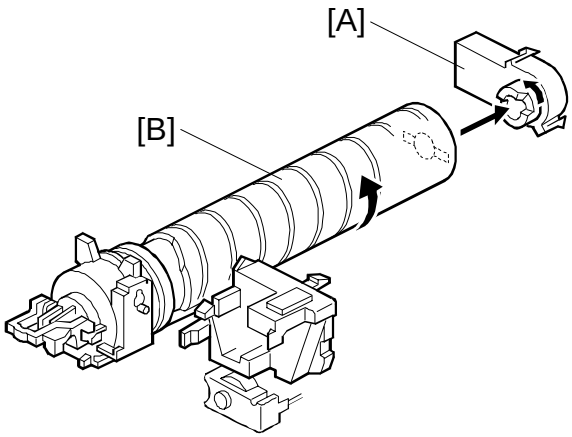
When a toner bottle is placed in the bottle holder unit [A] and the unit is pushed in completely, the pin [B] moves against the side [C] of the PCU, and pulls out the toner shutter [D] to open the bottle. When the toner bottle holder lever [E] is put back in the original position, the cap [F] on the toner bottle is pulled away and kept in place by the chuck [G].

The toner supply mechanism transports toner from the bottle to the development unit. The toner bottle has a spiral groove [H] that helps move toner to the development unit.

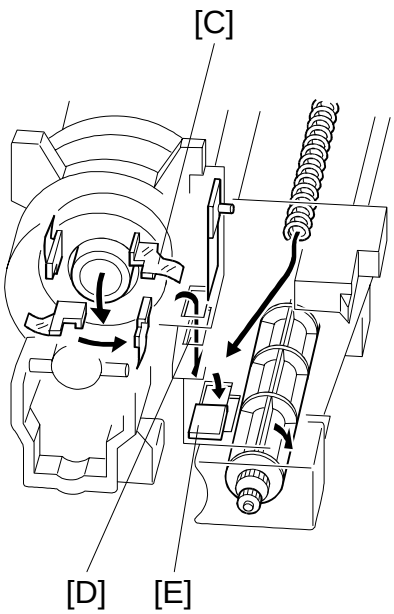
When the bottle holder unit is pulled out to add a new toner bottle, the following events happen automatically to prevent toner from scattering.

- The chuck releases the toner bottle cap into its proper position.
- The toner shutter shuts to block the opening because of pressure from a spring.

Toner supply mechanism



G035D505.WMF



G035D452.WMF

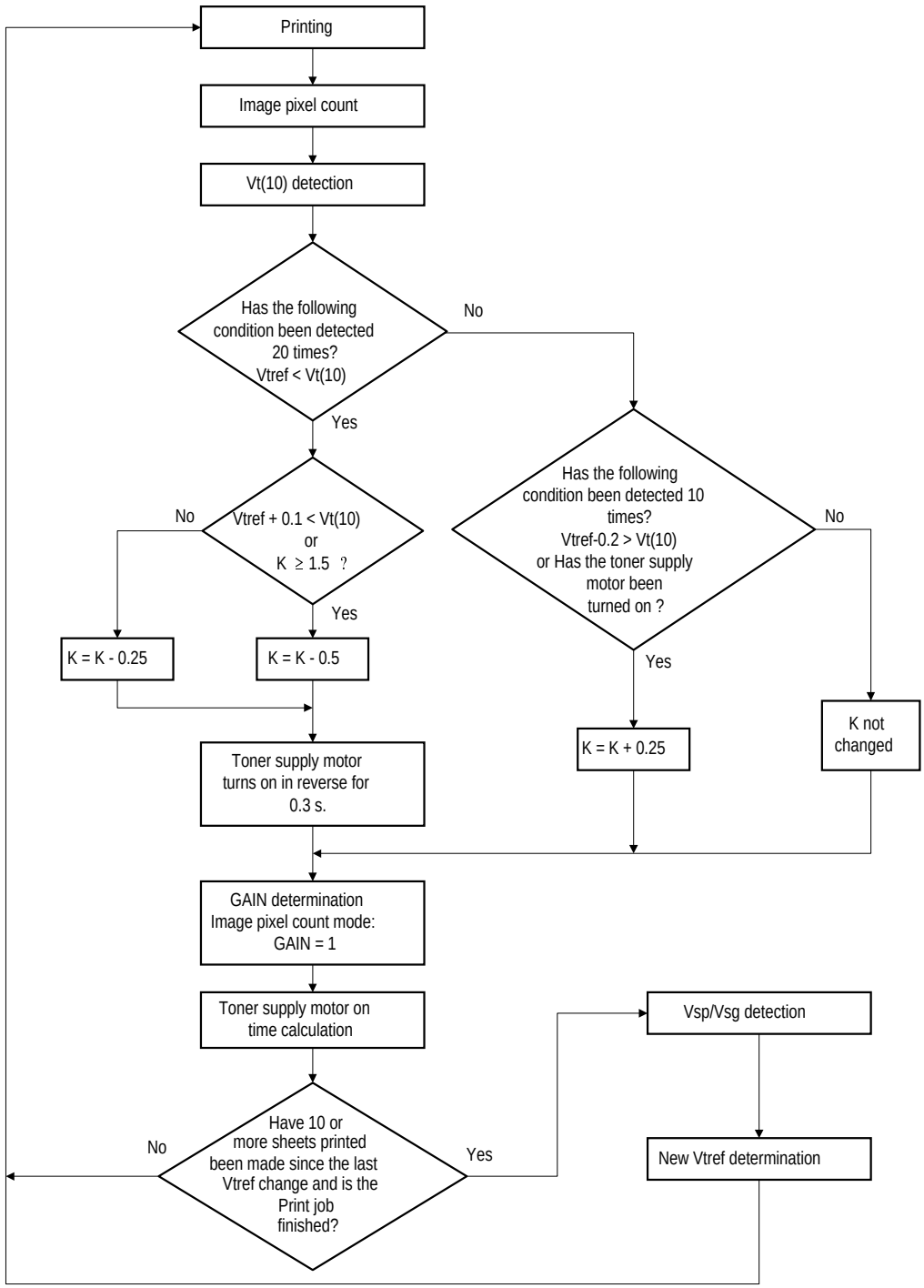
The toner supply motor [A] drives the toner bottle [B] and the mylar blades [C]. First, the toner falls down into the toner bottle holder. The toner supply mylar blades transfer the toner to the slit [D]. When the PCU is installed into the machine, the development unit opens the shutter [E] under the PCU. Then the toner falls down into the development unit through the slit and the shutter.

2.5.6 TONER DENSITY CONTROL

Overview

This machine uses sensor control mode to control toner supply.

Toner Density Control Flow Chart



G035D540.WMF

Toner Supply Control Procedure

In sensor control mode, the machine varies the toner supply for each print, to maintain the correct proportion of toner in the developer and to account for changes in drum reflectivity over time. The adjustment depends on two factors:

- The amount of toner required to print the page (based on a black pixel amount for the page)
- Readings from the TD sensor and ID sensor

Each step of the previous flow chart is explained in more detail on the following pages.

Toner Density Sensor Initial Setting

When new developer with standard toner concentration is installed (12.5 g of toner in 500 g of developer; 2.5% by weight), use SP2-801 to do the initial setting for the TD sensor. This sets the sensor output to 4.0 V. This value is used as the toner supply reference voltage (V_{tref}) for the TD sensor.

Image Pixel Count

The CPU adds up the image data value of each pixel and converts the sum to a value between 0 and 255. The value would be 255 if the page was completely black or 0 if it were completely white.

Vt(10) Detection

The toner density in the developer is detected once every print cycle. The sensor output voltage $V_t(10)$ is the average of the 10 most recent sensor output voltage readings.

Toner Density Measurement

The machine compares Vt (10) and Vtref. If Vt (10) is greater than Vtref, the toner concentration in the development unit is low and more toner should be added.

When Vt (10) > Vtref has been detected 20 times (toner concentration is consistently low), 0.1 is added to Vref, and the conditions are checked again. The result decides the value of “K” (toner supply rate coefficient), which is one of the factors in the toner supply motor on time calculation.

If Vt (10) > Vtref has not been detected 20 times, 0.2 is subtracted from Vtref, and “K” is decided in a similar way as for the previous condition.

GAIN Determination

GAIN is another factor in the toner supply motor on time calculation. It is decided using the following data.

- Vtref – Vt(10)
- Ten most recent Vt values

Toner Supply Motor on Time Calculation

The toner supply motor on time is decided using the following formula:

$$\left[\frac{0.7\text{mg/cm}^2 \times \text{Image Pixel Count} \times \text{Gain}}{\text{Toner Supply Rate} \times K} + \frac{(Vt - Vtref) \times 10{,}000}{\text{Toner Supply Rate} \times K}\right] \quad \text{.....(1)}$$

$$\left[\times \frac{(255 - \text{Image Pixel Count})}{255} \times \frac{\text{Gain}}{6}\right] \quad \text{.....(2)}$$

NOTE: 1) The toner supply rate can be changed using SP2-209.
2) K = Toner supply rate coefficient (0.25 ~ 3.0: default = 3.0).
3) The bracket (2) in the above formula is only used if Vtref < Vt.
4) The maximum toner supply motor on time is 1.2 s.

Vsp and Vsg Detection

The ID sensor (at the lower right area of the drum) detects the following voltages.

- Vsg: The ID sensor output when checking the drum surface.
- Vsp: The ID sensor output when checking the ID sensor pattern.

In this way, the reflectivity of both the drum surface and the pattern on the drum are checked. This compensates for any variations in the reflectivity of the pattern on the drum or the reflectivity of the drum surface.

The ID sensor pattern is made on the drum by the charge roller and laser diodes.

Vsg/Vsp is detected every 10 sheets printed to decide the new Vtref.

New Vtref Determination

Even if the toner concentration in the developer is maintained by checking the TD sensor, the toner potential (chargeability) and the image density both change with humidity and the amount of toner on the carrier. Therefore, the actual image density, using the ID sensor output, is also used as one of the factors for deciding the new Vtref, which is used for toner density control.

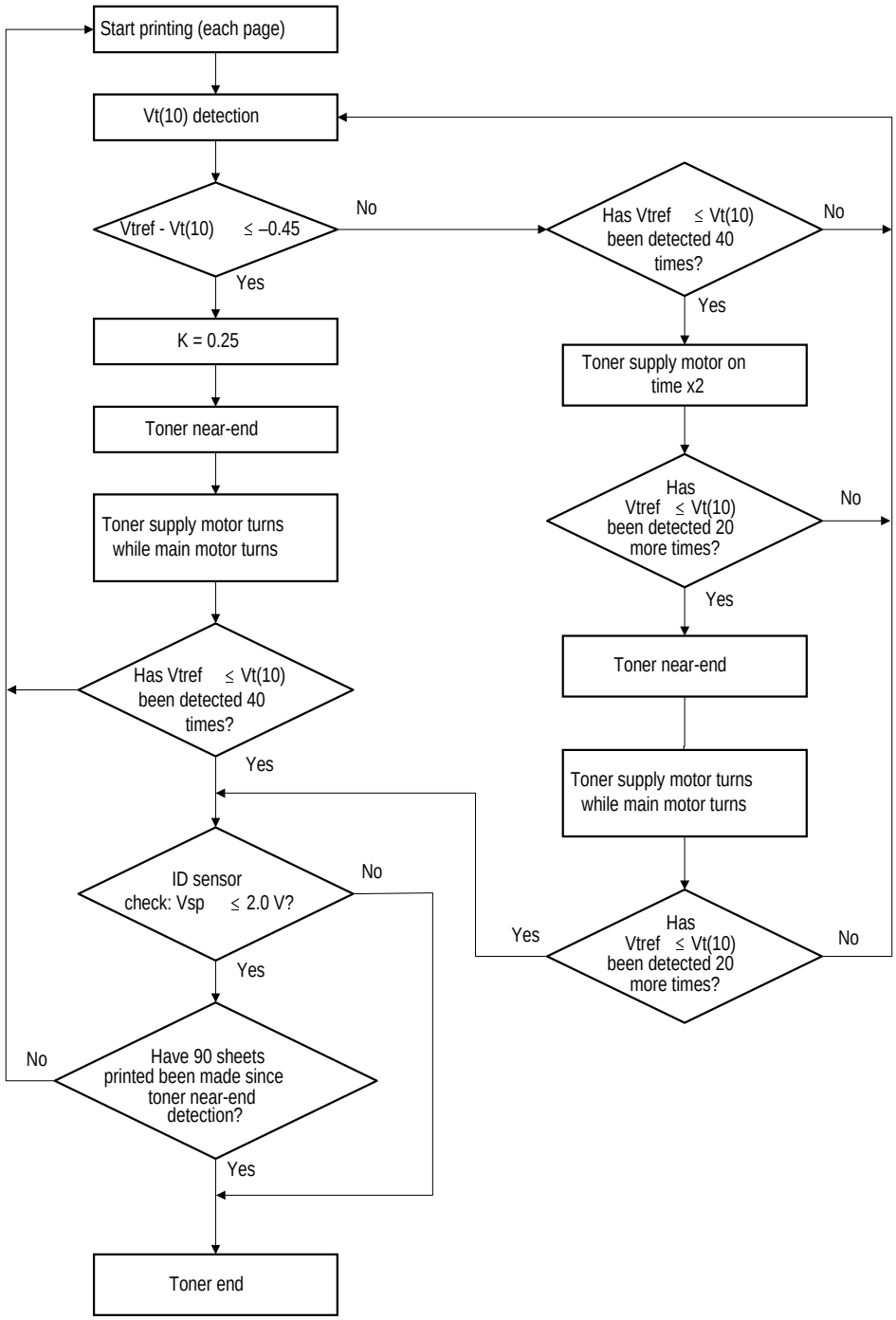
The new Vtref is determined using the following data.

- Vtref – Vt(10)
- Vsp/Vsg

From this point, toner density control is done using the new Vtref.

2.5.7 TONER NEAR END/END DETECTION

Toner Near End/End Detection Flow Chart



G035D538.WMF

Toner near end is detected using the TD sensor output data.

If Vtref-Vt (10) is less than or equal to –0.45, the toner concentration is very low. “K” becomes 0.25 and the machine enters the toner near end condition. Then, the toner supply motor turns on to supply toner.

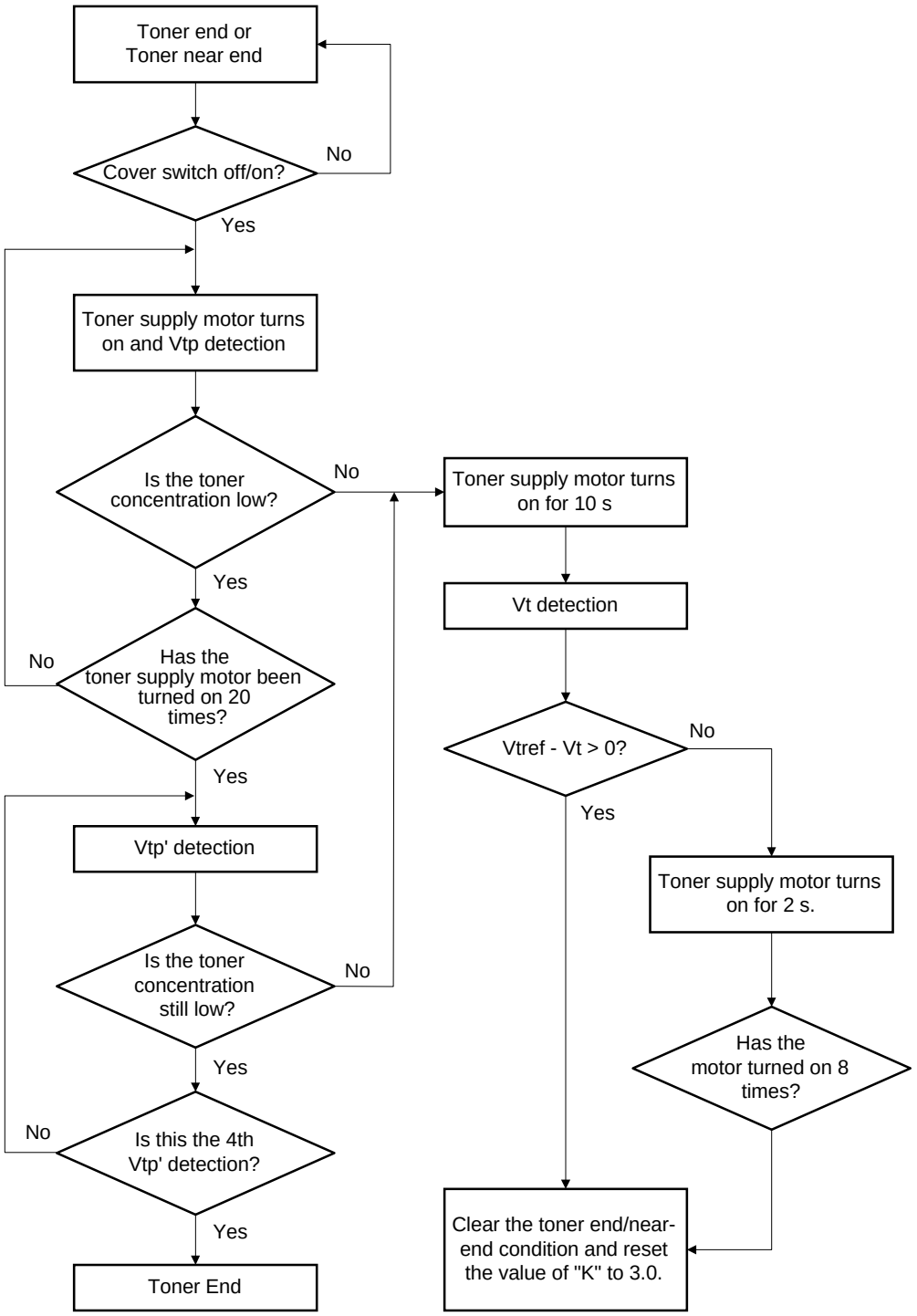
If Vtref-Vt (10) is greater than –0.45, the toner concentration is still not terribly low, but the machine does further tests by comparing Vtref and Vt (10). If the machine has detected 40 times that Vt (10) is greater than Vtref, the toner supply motor turns on for double the time that it would be with the previous formula. If the toner concentration is still low, the machine enters the toner near end condition.

Toner end is detected using the ID sensor.

If Vsp is bigger than 2.0V, the density of the ID sensor pattern is very light, so the machine detects a toner end condition. However, if Vsp stays less than 2.0V but 90 sheets printed have been made after toner near end was determined, the machine enters the toner end condition.

2.5.8 TONER END RECOVERY

Toner End Recovery Flow Chart



G035D539.WMF

If the front cover is opened and closed while a toner near end/end condition exists, the machine will attempt to recover the toner near end/end conditions using measurements from the TD sensor.

When the front cover is closed, the toner supply motor turns on to supply toner. The machine checks the TD sensor output 2 s after the main motor turns on. This is called Vtp. It is checked again every 1 second, and these values are called Vtp'.

The machine detects the toner concentration using Vtref, Vt (10), Vtp, and Vtp'. If the toner concentration is still too low, the toner supply motor turns on for another 10 seconds. Then, the machine checks Vt. If toner concentration is at the standard level, the toner near end/end condition is cancelled and "K" is reset. If toner concentration has not reached the standard level, the toner supply motor rotates continuously until it does (maximum motor on time is 16 seconds).

2.5.9 TONER SUPPLY IN ABNORMAL SENSOR CONDITIONS

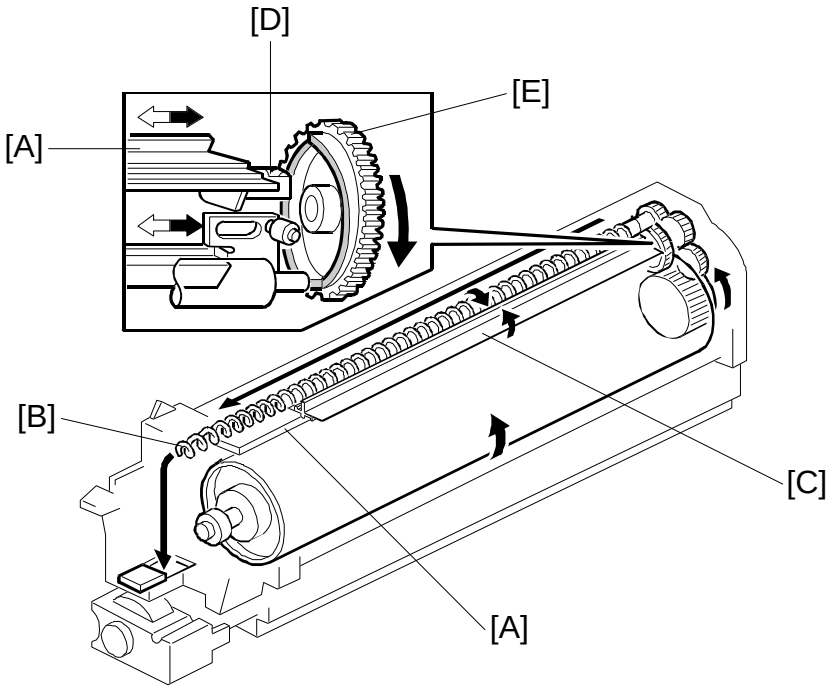
The TD sensor is checked every print. If the readings from the TD sensor become abnormal during a print job, the machine holds the GAIN factor constant (GAIN is normally calculated from TD sensor readings) to allow toner supply to vary with only pixel count for the rest of the print job. Then at the end of the print job, the machine generates an SC code requires repair.

The ID sensor is checked every 10 sheets printed. If readings become abnormal, the machine generates an SC code and requires repair. If this happens during a print job, Vtref is not changed, the print job is allowed to finish, and then the SC code is generated.

Details of how the machine determines abnormal sensor detection are in section 7 (Troubleshooting).

2.6 DRUM CLEANING AND TONER RECYCLING

2.6.1 DRUM CLEANING



G035D507.WMF

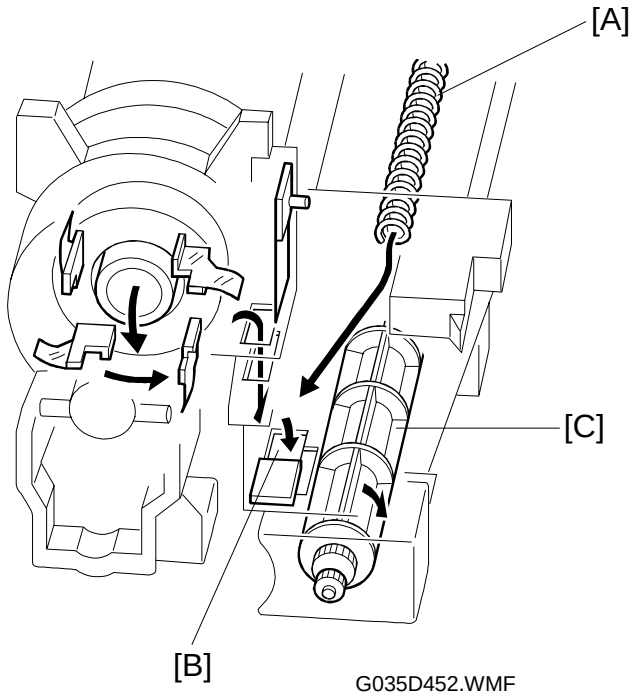
The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. This model uses a counter blade system.

The toner remaining on the drum is scraped off by the cleaning blade, and is transferred to the toner collection coil [B] by the toner collection plate [C].

The collar [D] on the cleaning blade bracket contacts the outer rim of the cam gear [E], and this gear moves the cleaning blade from side to side. (This gear is the same cam gear that moves the cleaning pad for the charge roller from side to side.) This movement helps to disperse spots of accumulated toner to prevent early blade edge wear at any particular location.

To remove the toner and other particles that have accumulated at the edge of the cleaning blade, the drum turns in reverse for about 5 mm at the end of every print job.

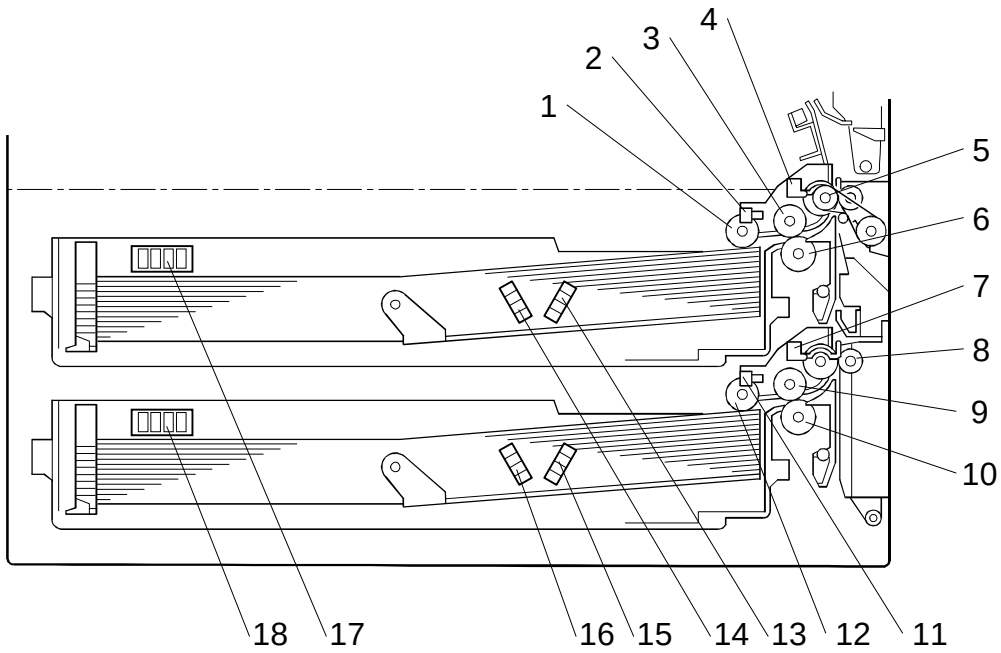
2.6.2 TONER RECYCLING



Toner transferred to the toner collection coil [A] is transported to the opening [B] in the bottom of the PCU. Then, it falls into the development unit with the new toner coming from the toner bottle, which the paddle roller [C] mixes together.

2.7 PAPER FEED

2.7.1 OVERVIEW



G035D701.WMF

There are two paper trays, each of which can hold 500 sheets.

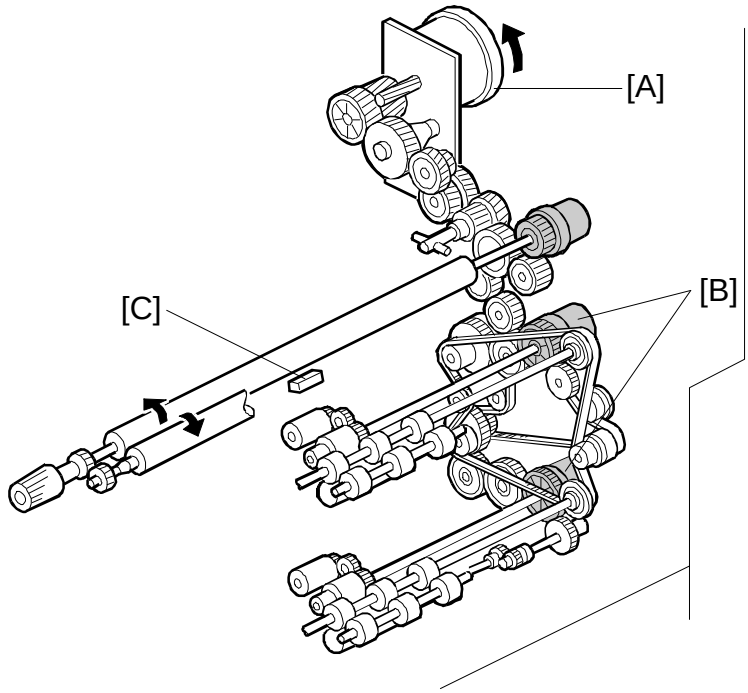
The paper tray feed stations use an FRR system.

There are two relay sensors, one just above each set of relay rollers. These sensors are used for paper jam detection.

The components of the paper feed section are as follows.

1. Upper pick-up roller
2. Upper paper lift sensor
3. Upper paper feed roller
4. Upper relay sensor
5. Upper relay roller
6. Upper separation roller
7. Lower relay sensor
8. Lower relay roller
9. Lower paper feed roller
10. Lower separation roller
11. Lower paper lift sensor
12. Lower pick-up roller
13. Upper paper height 2 sensor
14. Upper paper height 1 sensor
15. Lower paper height 2 sensor
16. Lower paper height 1 sensor
17. Upper paper size switch
18. Lower paper size switch

2.7.2 PAPER FEED DRIVE MECHANISM

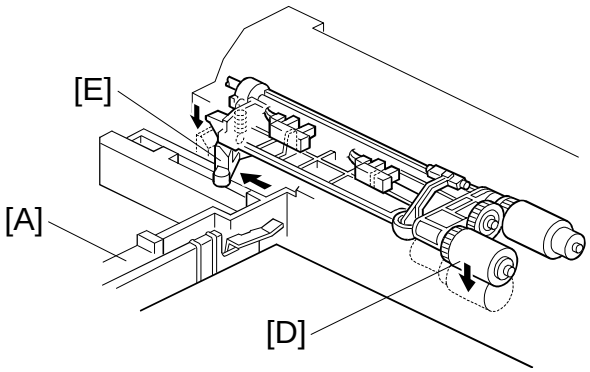


G035D508.WMF

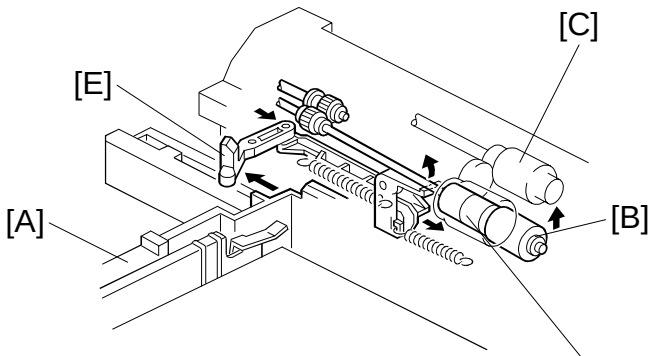
The main motor [A] drives the pick-up and feed mechanisms of both the upper and second paper feed stations using gears and paper feed clutches [B].

When the paper tray is inside the machine, the pick-up roller always in contact with the top sheet of the paper stack (see Pick-up and Separation Roller Release Mechanism for more detail). When the paper feed clutch turns on, the pick-up, paper feed, and separation rollers start rotating to feed the paper. The paper feed clutch stays on until shortly after the registration sensor [C] activates.

2.7.3 PICK-UP AND SEPARATION ROLLER RELEASE MECHANISM



G035D703.WMF

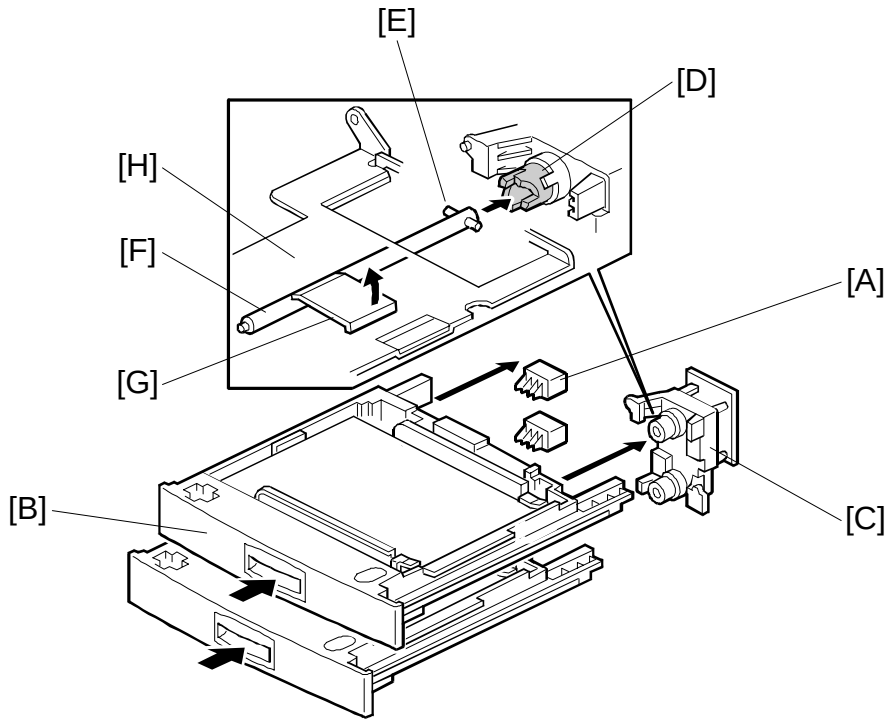


G035D704.WMF

When the paper tray [A] is not inside the machine, the separation roller [B] moves away from the paper feed roller [C] and the pick-up roller [D] stays in the upper position.

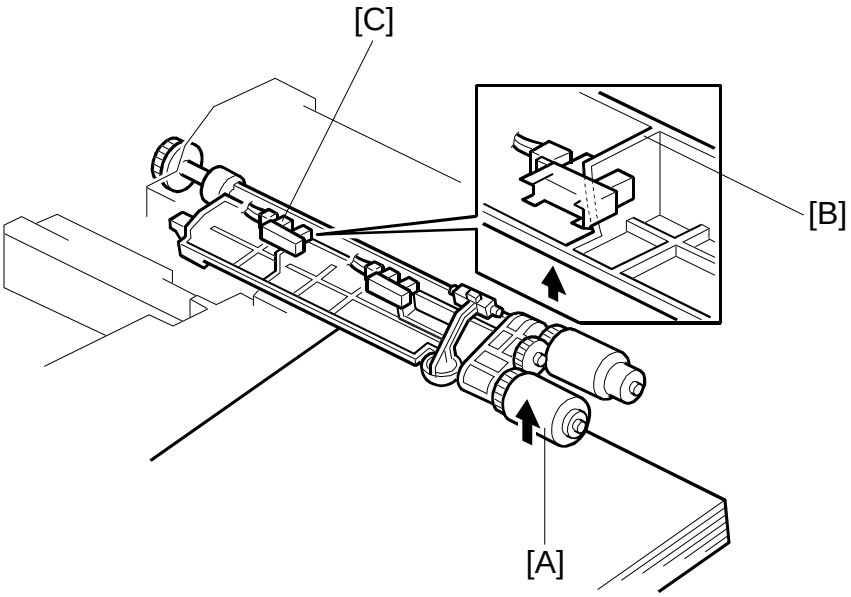
When the paper tray is placed in the machine, it pushes the release lever [E]. This causes the pick-up roller [D] to move down and the separation roller [B] to move up and contact the paper feed roller.

2.7.4 PAPER LIFT MECHANISM



G035D702.WMF

The paper size sensor [A] detects when the paper tray [B] is placed in the machine. When the machine detects that the paper tray is in the machine, the tray lift motor [C] rotates and the coupling gear [D] on the tray lift motor engages the pin [E] on the lift arm shaft [F]. Then the tray lift arm [G] lifts the tray bottom plate [H].



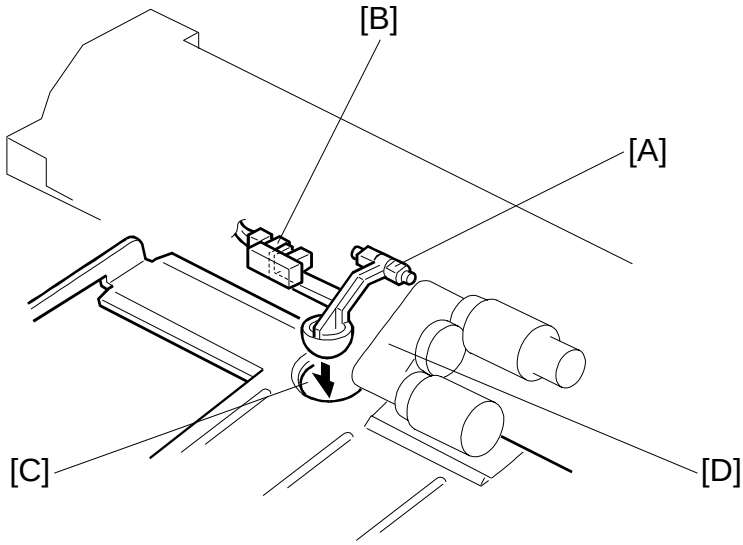
G035D526.WMF

When the paper tray is placed in the machine, the pick-up roller [A] lowers. When the top sheet of paper reaches the proper height for paper feed, the paper pushes up the pick-up roller, and the actuator [B] on the pick-up roller supporter activates the paper lift sensor [C] to stop the tray lift motor.

After several paper feed cycles, the paper level gradually lowers and the paper lift sensor is de-activated. The tray lift motor turns on again until this sensor is activated again.

When the tray is drawn out of the machine, the tray lift motor coupling gear disengages the pin on the lift arm shaft, and the tray bottom plate then drops under its own weight.

2.7.5 PAPER END DETECTION



G035D706.WMF

If there is some paper in the paper tray, the paper stack raises the paper end feeler [A] and the paper end sensor [B] deactivates.

When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate activating the paper end sensor.

When the paper tray is drawn out, the pick-up roller supporter [D] lifts up the paper end feeler.

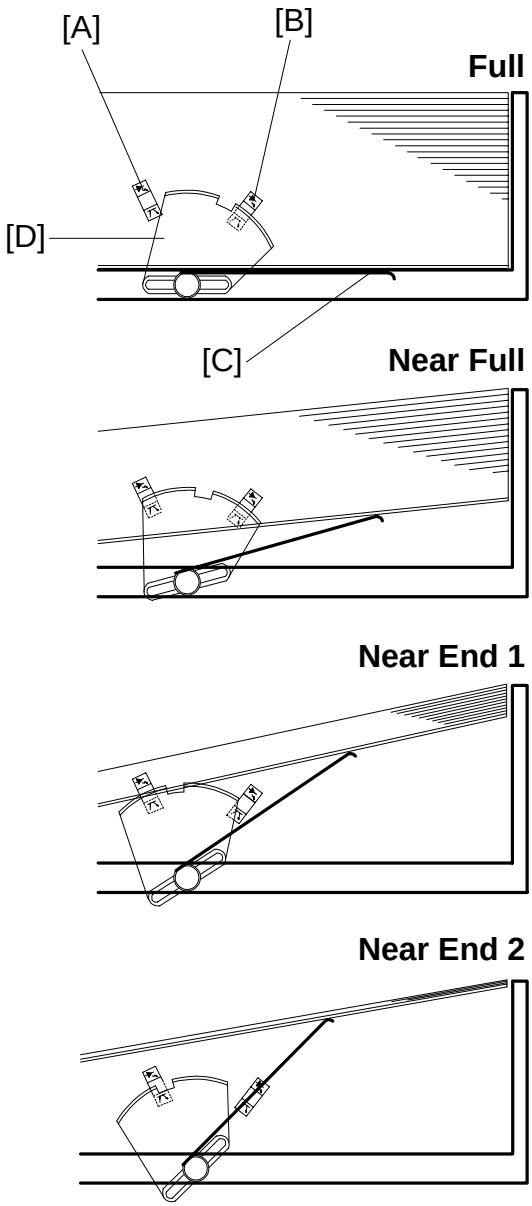
2.7.6 PAPER HEIGHT DETECTION

Two paper height sensors [A] and [B], working in combination, detect the amount of paper in the tray.

When the amount of paper decreases, the bottom plate pressure lever [C] moves up and the actuator [D] mounted on the same drive shaft as the pressure lever rotates.

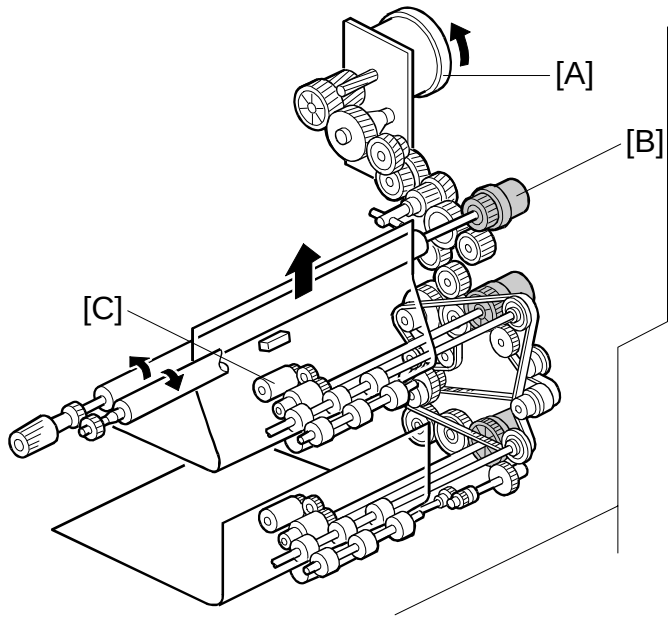
The following combinations of sensor signals are sent to the printer controller.

Amount of Paper	Paper Height Sensor [A]	Paper Height Sensor [B]
Full	OFF	ON
Near Full	ON	ON
Near End 1	ON	OFF
Near End 2	OFF	OFF



G035D707.WMF

2.7.7 PAPER REGISTRATION



G035D705.WMF

A train of gears transmits main motor [A] rotation to the registration clutch gear [B] (located on the lower registration roller shaft).

The registration sensor [C] is positioned just before the registration rollers.

When the leading edge of the paper activates the registration sensor, the registration clutch is off and the registration rollers are not turning. However, the relay clutch [E] stays on for a bit longer. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. Then, the registration clutch energizes and the relay clutch re-energizes at the proper time to align the paper with the image on the drum. The registration and relay rollers feed the paper to the image transfer section.

The registration sensor is also used for paper misfeed detection.

2.7.8 PAPER SIZE DETECTION

The paper size switch includes four sensors (microswitches). Actuators behind the paper size dial actuate the sensors.

Each paper size has its own actuator, with a unique combination of notches. To determine the paper size, the CPU reads which switches the actuator has turned off.

The CPU disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the printer control board recognizes that the paper tray is not installed.

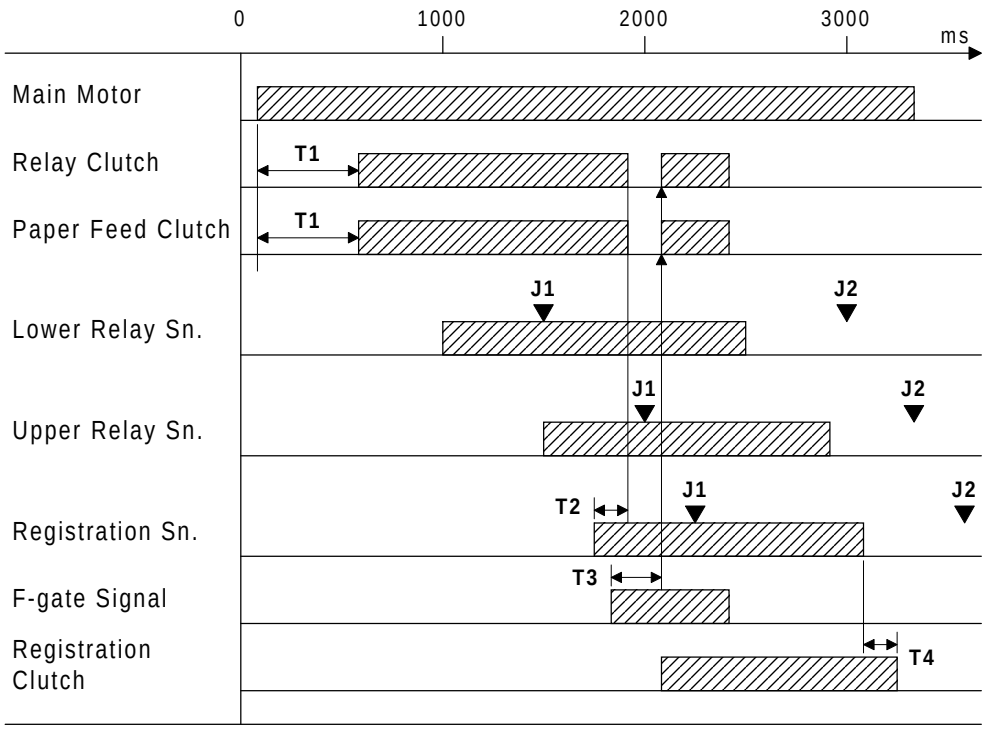
When the paper size actuator is at the "*" mark, the paper tray can be set up to accommodate one of a wider range of paper sizes by using one of the user tools on the machine's operation panel.

Models		Switch Location			
North America	**Europe**	**1**	**2**	**3**	**4**
8 1/2" x 13" Portrait	A3 Portrait	ON	ON	OFF	ON
A4 Landscape	A4 Landscape	ON	ON	ON	ON
A4 Portrait	A4 Portrait	ON	OFF	ON	ON
11" x 17" Portrait	A5 Portrait	OFF	OFF	ON	ON
8 1/2" x 14" Portrait	8" x 13" Portrait	ON	OFF	OFF	OFF
8 1/2" x 11" Portrait	8 1/2" x 11" Portrait	ON	ON	OFF	OFF
8 1/2" x 11" Landscape	8 1/2" x 11" Landscape	ON	OFF	ON	OFF
*	*	ON	ON	ON	OFF

ON: Pushed OFF: Not Pushed

2.7.9 PAPER FEED AND JAM TIMING

From 2nd Paper Tray (A4 sideways)



G035D537.WMF

T1: The relay clutch and paper feed clutch turn on 500 ms after the main motor.

T2: The relay clutch and paper feed clutch turn off 138 ms after the registration sensor turns on.

T3: The relay clutch and paper feed clutch turn on again and the registration clutch turns on 186 ms after the F-gate signal (laser main scan writing start) has been activated.

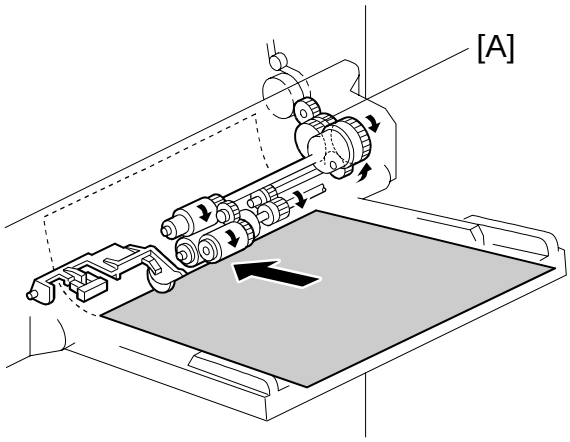
T4: The registration clutch turns off 150 ms after the registration sensor.

J1: Checks whether the sensors are activated within 0.3 seconds after the designated time for these sensors.

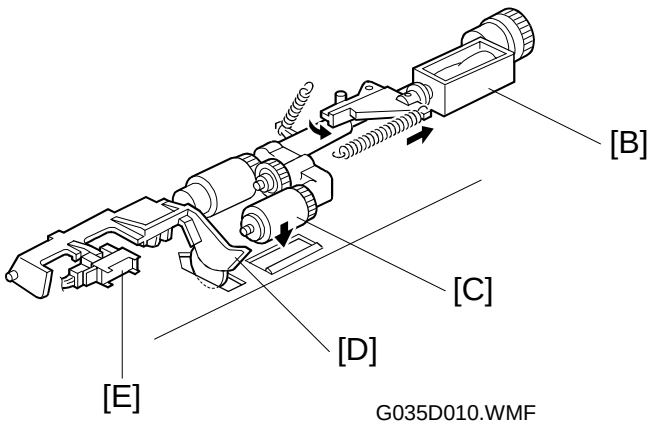
J2: Checks whether the sensors are deactivated within 0.3 seconds after the designated time for these sensors.

2.8 BY-PASS FEED

2.8.1 BASIC OPERATION



G035D009.WMF



G035D010.WMF

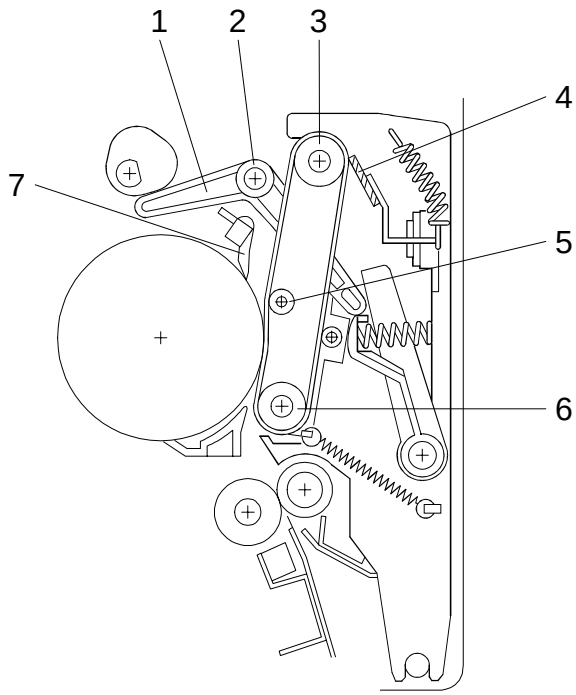
The printer, through gear [A], directly drives this unit.

When printing starts, the pick-up solenoid [B] turns on and the pick-up roller [C] moves onto the paper.

When the by-pass tray runs out of paper, the paper end feeler [D] drops into the cutout in the by-pass tray activating the paper end sensor [E].

2.9 IMAGE TRANSFER AND PAPER SEPARATION

2.9.1 OVERVIEW



G035D561.WMF

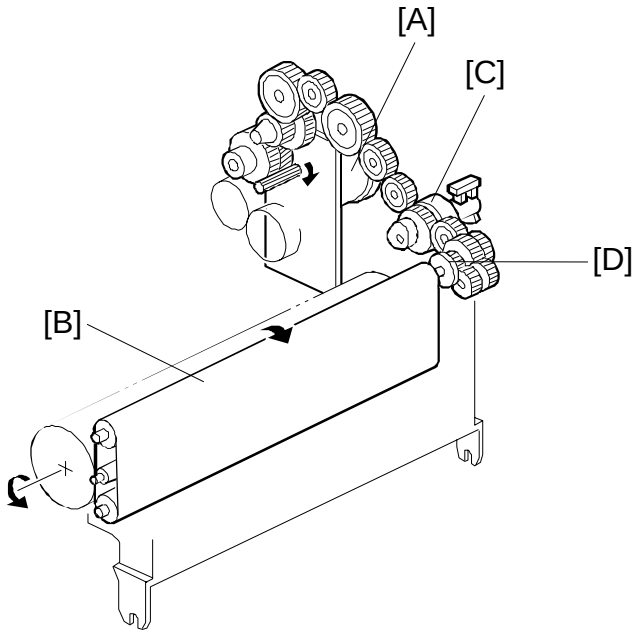
Instead of using a transfer corona or a transfer roller, this machine uses a transfer belt unit. The transfer belt unit consists of the following parts.

1. Contact lever
2. Transfer belt
3. Drive roller
4. Transfer belt cleaning blade
4. Transfer roller
5. Idle roller
6. Pick-off pawl

The belt has a high electrical resistance, so it can hold a high positive electrical potential to attract toner from the drum onto the paper. Also, the electrical potential attracts the paper itself and helps to separate the paper from the drum and to carry the paper upwards. The pick-off pawl ensures that the paper separates from the drum.

The transfer belt cleaning blade removes toner from the transfer belt to prevent the back side of the paper from being stained.

2.9.2 BELT DRIVE MECHANISM



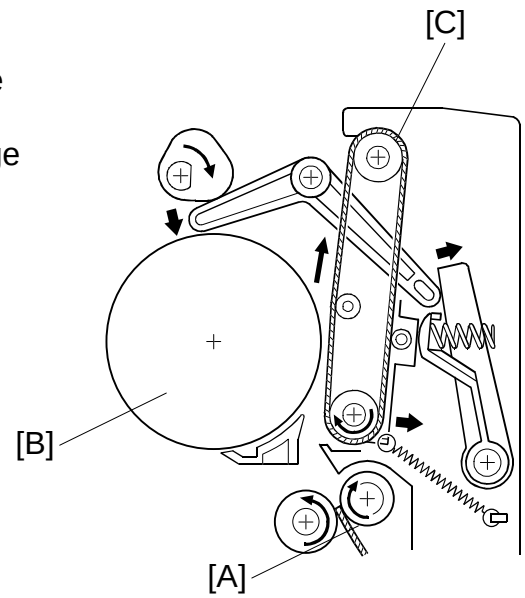
G035D509.WMF

The main motor [A] drives the transfer belt [B] through a train of gears, the belt contact clutch [C], and the drive roller gear [D].

2.9.3 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM

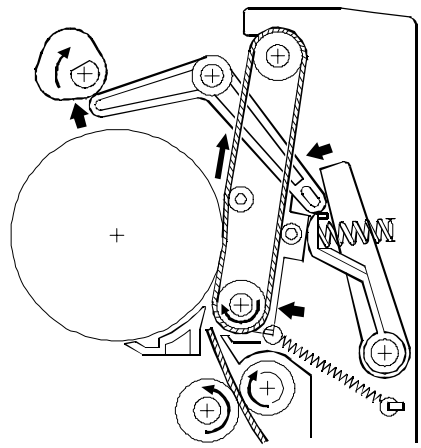
The image is transferred from the drum in the following steps.

1. The registration clutch turns on to feed the paper [A] at the correct time to synchronize the leading edge of the developed latent image on the drum [B] with the leading edge of the paper. The transfer belt [C] is not in contact with the drum at this time.



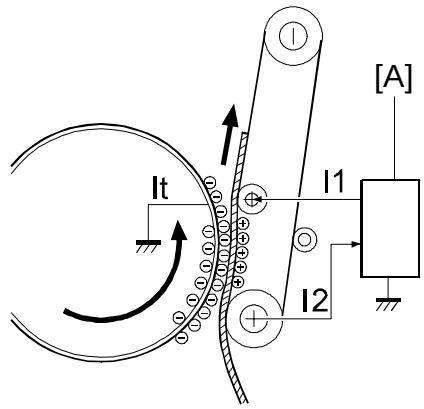
G035D522.WMF

2. The transfer belt contact clutch turns on at a certain time after the main motor starts. Then, the transfer belt moves into contact with the drum.



G035D523.WMF

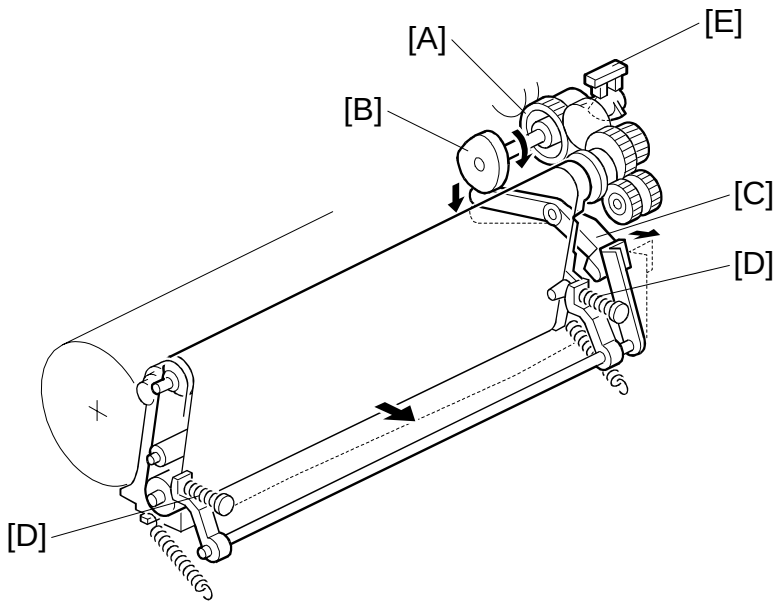
3. When the paper enters the gap between the belt and the drum, the high voltage supply board [A] applies a high positive current to the belt to transfer the image to the paper.
   $I1 = It + I2$



G035D521.WMF

4. After receiving the image from the drum, the paper is fed by the belt.
5. The paper moves to the end of the transfer belt unit, where it separates from the belt as the belt curves away. Then, the paper goes to the fusing unit.

2.9.4 TRANSFER BELT UNIT CONTACT MECHANISM



G035D562.WMF

The belt contact and release mechanism consists of the belt contact clutch [A], cam [B], and contact lever [C].

The belt contact clutch turns on and the cam with the clutch rotates half of a complete rotation. The contact lever, riding on the cam, is lifted up and the spring [D] pushes the belt into contact with the drum.

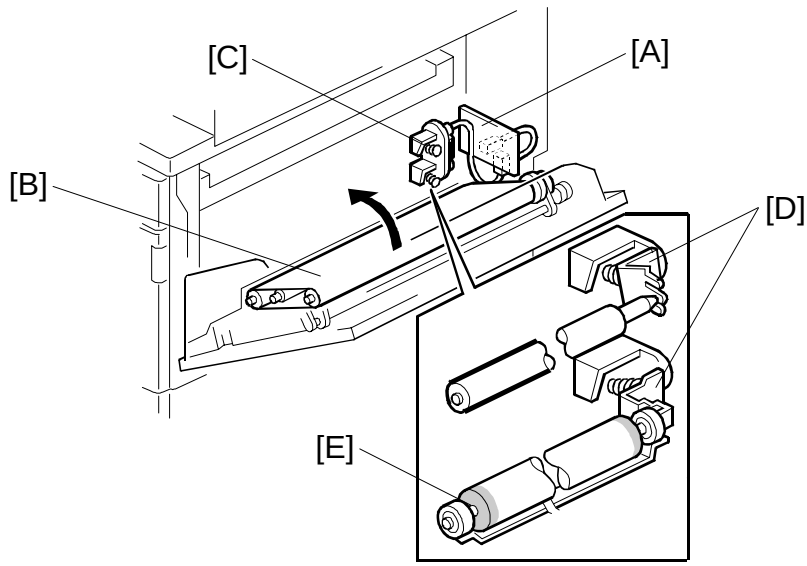
The home position sensor [E] for the transfer belt contact detects the home position of the cam (this is when the belt is away from the drum).

The belt must be released from the drum between print jobs. The reasons for this are as follows.

- To prevent the ID sensor pattern on the drum from being rubbed off by the transfer belt.
- To prevent a change in the drum's characteristics because of the influence of additives inside the rubber belt.

2.9.5 TRANSFER BELT CHARGE

Overview

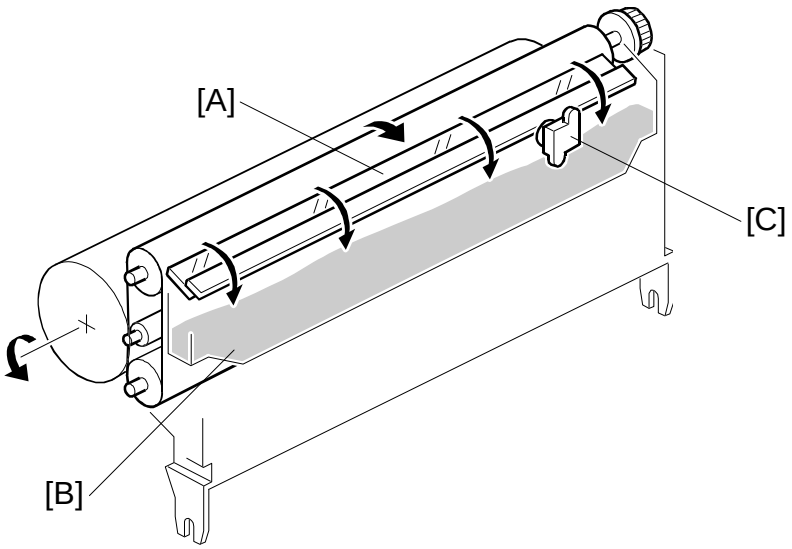


G035D554.WMF

The high voltage supply board [A] applies positive transfer belt current to the transfer belt [B] through the terminal block [C], terminal plate [D], and the roller [E]. The terminal block and the terminal plate come in contact with each other when the right cover is closed.

The high voltage supply board adjusts the current supplied to the roller to keep a small but constant current flow to ground through the belt, paper, and drum. If this current is not maintained, the efficiency of the toner transfer and paper separation processes will vary with paper thickness, type, environmental condition, or changes in transfer belt surface resistance.

2.9.6 TRANSFER BELT CLEANING MECHANISM



G035D524.WMF

The cleaning blade [A] is always in contact with the transfer belt. It scrapes off any toner and paper dust remaining on the belt.

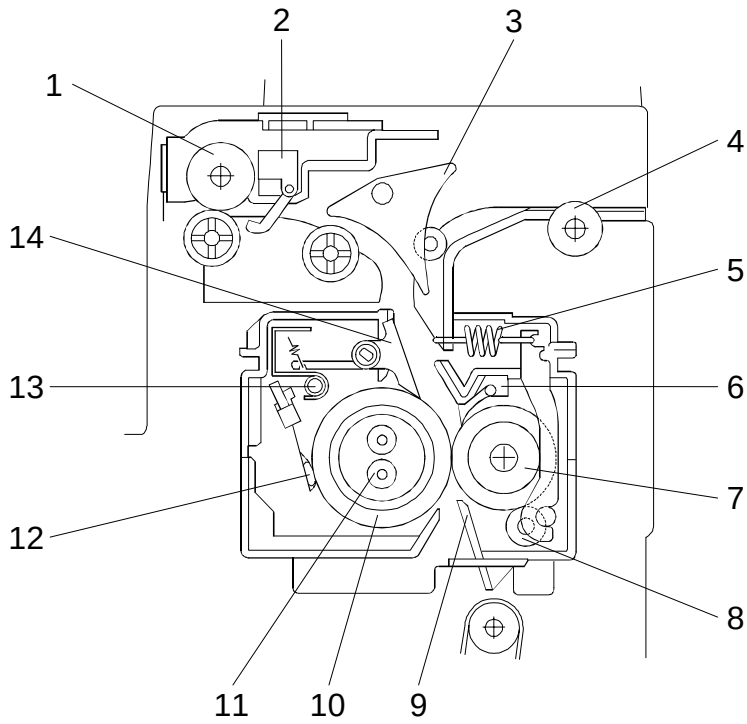
To remove toner and other particles that are accumulated at the edge of the cleaning blade, the transfer belt turns in reverse at the end of every print job, in the same way as the drum cleaning blade mechanism.

The toner and paper dust that is scraped off falls down into the toner collection tank [B], which is in the transfer belt unit. This toner is not recycled.

When the toner overflow sensor [C] in the transfer belt unit detects toner overflow, the toner overflow indicator lights. After this, 999 printed sheets can be made before machine operation stops.

2.10 IMAGE FUSING AND PAPER EXIT

2.10.1 OVERVIEW



G035D514.WMF

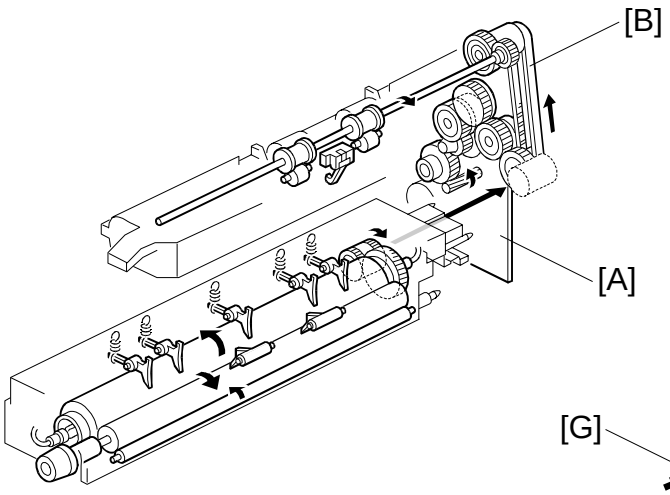
This fusing unit contains pressure roller strippers [6]. These prevent the paper from wrapping around the pressure roller (which is possible for a vertical paper transport mechanism).

The fusing unit and paper exit area consist of the following parts.

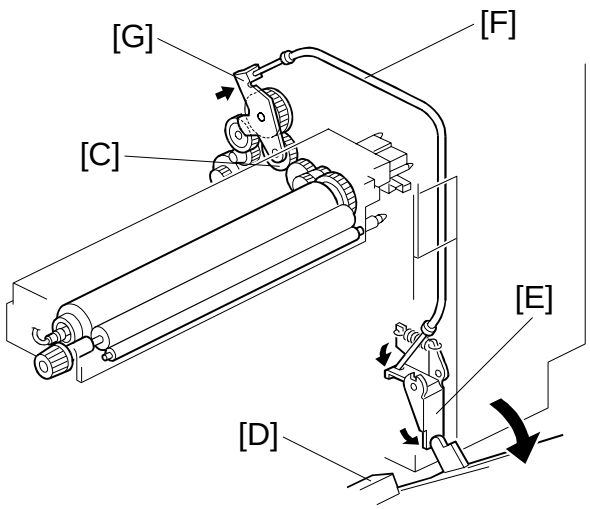
1. Paper exit roller
2. Fusing exit sensor
3. Junction gate
4. Transport roller
5. Pressure spring
6. Pressure roller strippers
7. Pressure roller
8. Cleaning roller
9. Entrance guide
10. Hot roller
11. Fusing lamp(s) (see the note)
12. Thermistor
13. Thermofuse
14. Hot roller strippers

NOTE: For 115 V machines: One lamp.
For 230 V machines: Two lamps.

2.10.2 FUSING DRIVE AND RELEASE MECHANISM



G035D604.WMF



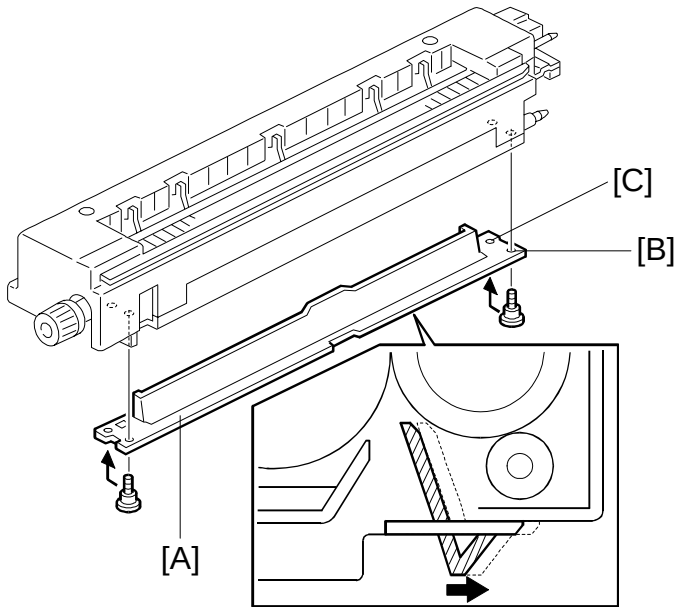
G035D605.WMF

The main motor [A] drives the fusing unit through a train of gears and drives the paper exit rollers with a gear and a timing belt [B].

The fusing unit drive release mechanism automatically disengages the fusing unit drive gear [C] when the right cover [D] is opened. This allows the fusing unit drive gear to rotate freely so that misfed paper can be easily removed.

When the right cover is opened, the actuator plate [E] pulls release wire [F]. The wire pulls the fusing drive gear bracket [G] and the fusing unit drive disengages.

2.10.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM



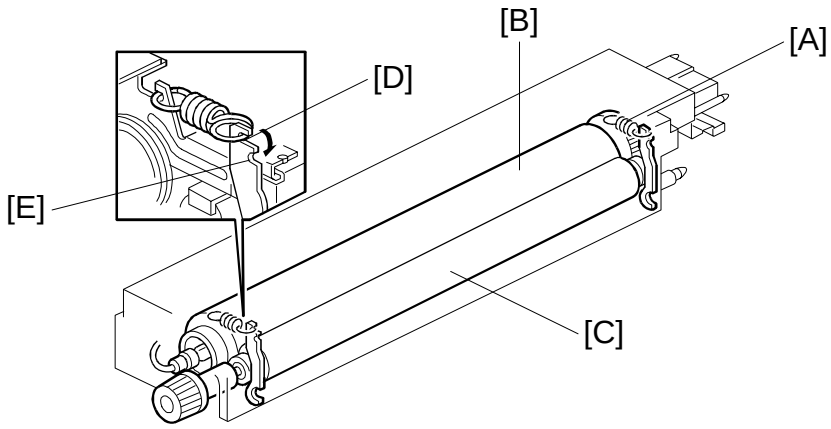
G035D608.WMF

The entrance guide [A] for this machine has two holes on each side to adjust for paper thickness, and to prevent creasing. Normally, the right screw hole [B] on each side is used for these purposes.

For thin paper, move the entrance guide to the left by securing it with screw holes [B]. This slightly lengthens the paper path, preventing the paper from creasing in the fusing unit.

For thick paper, move the entrance guide to the right (use screw holes [C]). This setting allows more direct access to the gap between the hot and pressure rollers. This prevents thick paper from buckling against the hot roller, which can cause blurring at the leading edge of the print. This setting also aids in preventing thick paper from bending easily, making it less likely to crease.

2.10.4 PRESSURE ROLLER

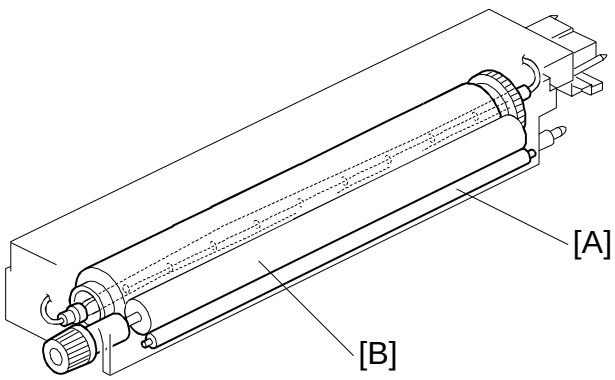


G035D603.WMF

The pressure springs [A] constantly apply pressure between the hot roller [B] and the pressure roller [C].

Adjusting the position of the pressure springs can change the pressure. The left position [D] is the normal setting. The right position [E] increases the pressure and this maintains the fusing efficiency of the fusing unit.

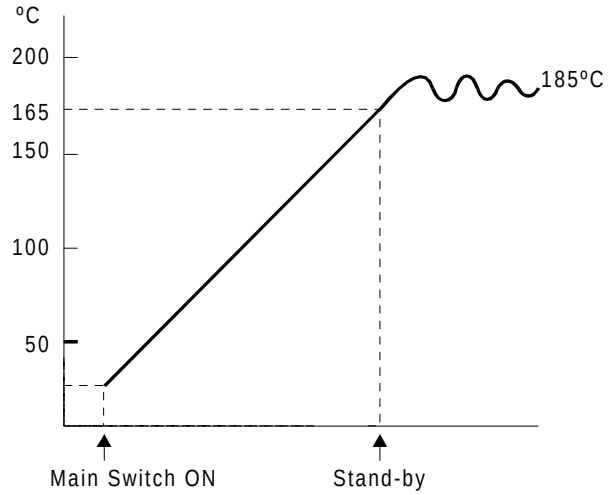
2.10.5 CLEANING MECHANISM



G035D515.WMF

The cleaning roller [A] is always in contact with the pressure roller [B]. It collects toner and paper dust adhering to the surface of the pressure roller. This is because the cleaning roller is made of metal and collects matter more easily than the pressure roller, which has a Teflon coating.

2.10.6 FUSING TEMPERATURE CONTROL



G035D518.WMF

Temperature Control

There are two types of control: on/off and phase. Use SP2-3 to toggle between the two modes.

When the main power switch turns on, the CPU checks the AC frequency for 500 milliseconds; this is done in case phase control mode is selected at a later time. Then the CPU turns on the fusing lamp. When the thermistor detects the stand-by temperature (165°C), the machine can start to print. When the thermistor detects the operating temperature (185°C), the CPU turns the fusing lamp off/on to maintain this temperature.

Fusing Idling

To fuse toner at the proper time after the main power switch is turned on, fusing idling should be done when the temperature at power-up is 15°C or less and the temperature reaches the value of SP2-4-1 (Fusing temperature adjustment): –20°C

The fusing idling time is as follows.

Power-up temperature	Fusing idling time
15°C or less	30 seconds
Higher than 15°C	Not performed

2.10.7 OVERHEAT PROTECTION

If the hot roller temperature becomes greater than 230°C, the CPU cuts off the power to the fusing lamp. At the same time, an SC543 is generated.

Even if the thermistor overheat protection fails, there is a thermofuse in series with the common ground line of the fusing lamp. If the temperature of the thermofuse reaches 169°C, the thermofuse opens, removing power from the fusing lamp. At the same time, the copier stops operating. At this time, an SC542 is generated.

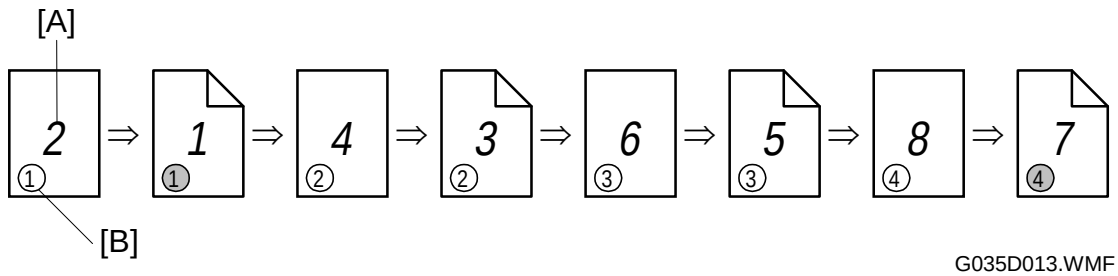
2.11 DUPLEX

2.11.1 BASIC OPERATION

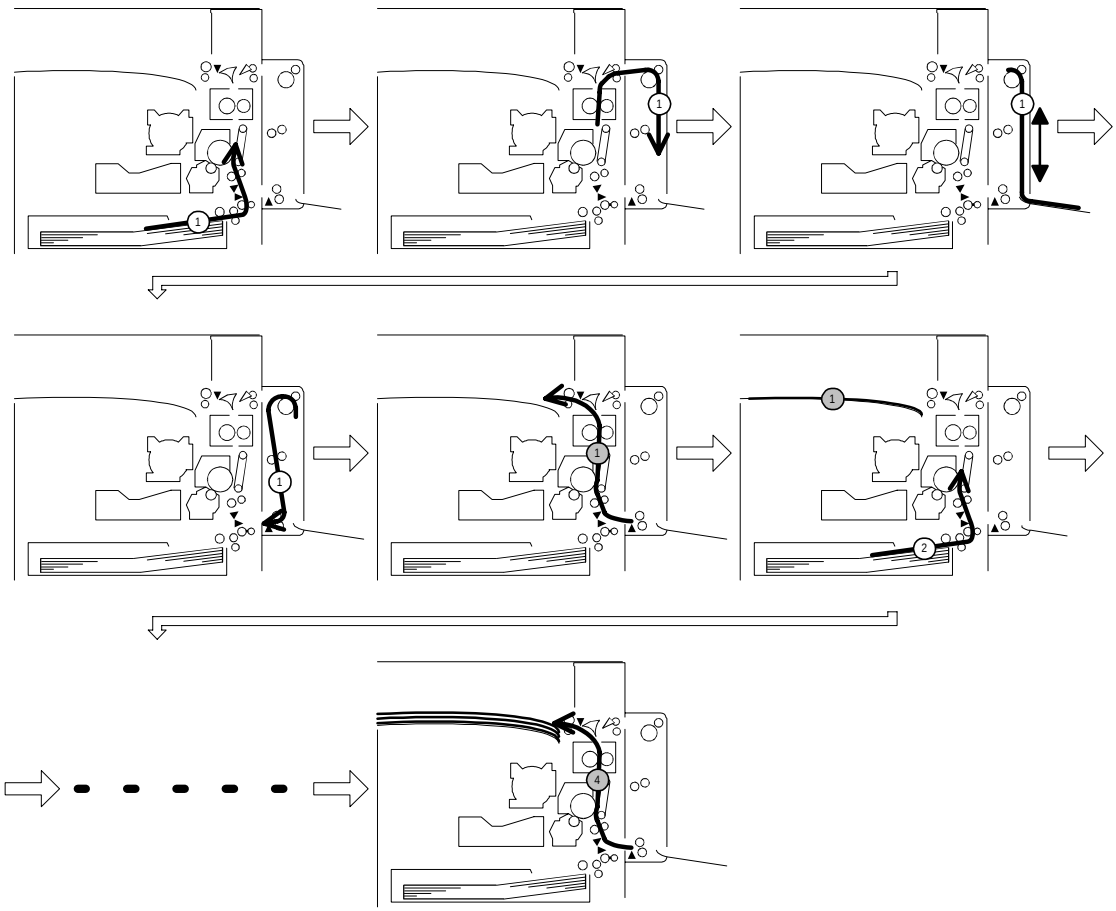
Larger than A4 lengthwise/LT lengthwise

The duplex unit can store only one sheet of paper.

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of paper (if shaded, this indicates the second side).



G035D013.WMF

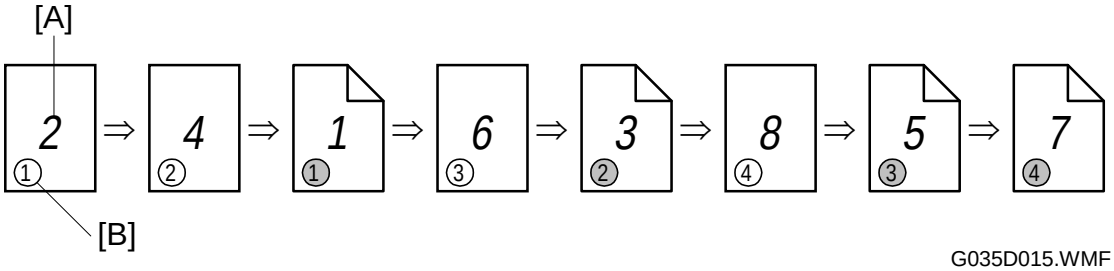


G035D014.WMF

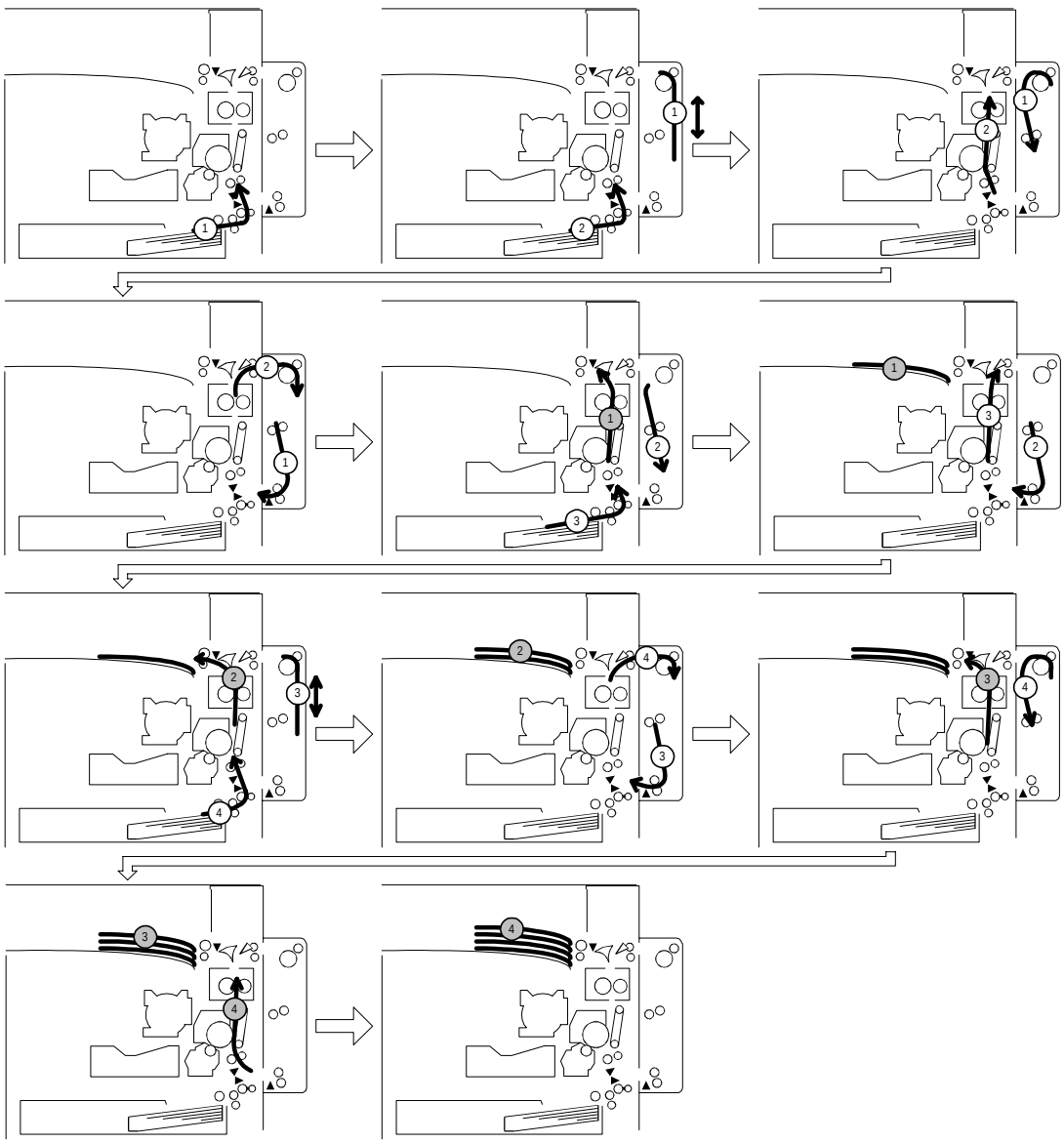
Up to A4 lengthwise/LT lengthwise

The duplex unit can store two sheets of paper

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of paper (if shaded, this indicates the second side).

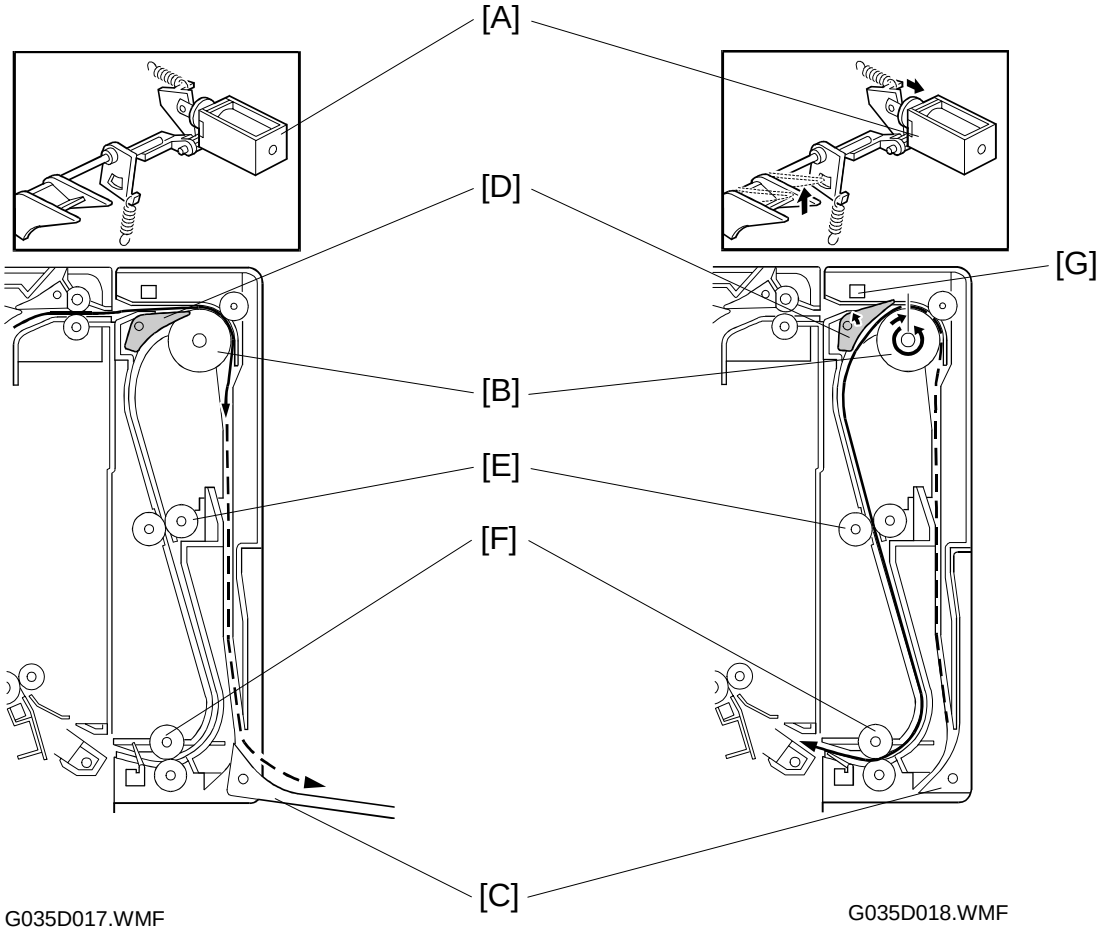


G035D015.WMF



G035D016.WMF

2.11.2 FEED IN AND EXIT MECHANISM



Feed-in

The inverter gate solenoid [A] stays off and the inverter roller [B] rotates clockwise. A sheet of paper is sent to the inverter section. The inverter section can stack sizes of up to A4 lengthwise when the cover guide [C] is closed. The user must open the cover guide when using larger sizes of paper (longer than A4/LT lengthwise).

Inversion and Exit

The inverter gate solenoid turns on and the inverter motor turns on in reverse shortly after the trailing edge of the paper passes through the entrance sensor [G]. As a result, the inverter gate [D] opens and the inverter roller rotates counterclockwise. The paper passes through the upper and lower transport rollers [E, F] to the copier.

2.12 ENERGY SAVER MODE

When the machine is not used, the energy saver feature reduces power consumption by switching off fusing lamp.

Entering the Energy Saver Mode

Energy saver mode starts after the machine has been idle for a certain time. The user specifies this time by user menu. The following choices are available.

- 0 minute: Off (energy saver mode never activates)
- 15 minutes
- 30 minutes (default)
- 1 hour
- 2 hours
- 3 hours

If the user selects “No” for Auto off mode (SP2-17), "0 minutes" does not appear on the LCD in the user menu. (The user will not be able to select “Off” mode.)

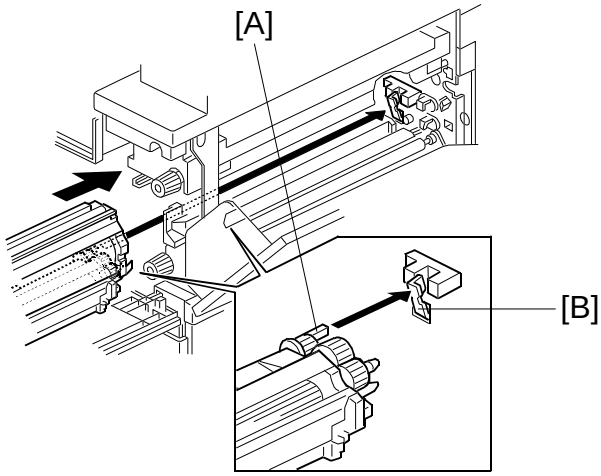
NOTE: When the machine is in energy saver mode, the CPU turns off the fusing lamp. Therefore, the time from the print start command to the start of printing is longer than in normal standby mode.

Leaving Energy Saver Mode

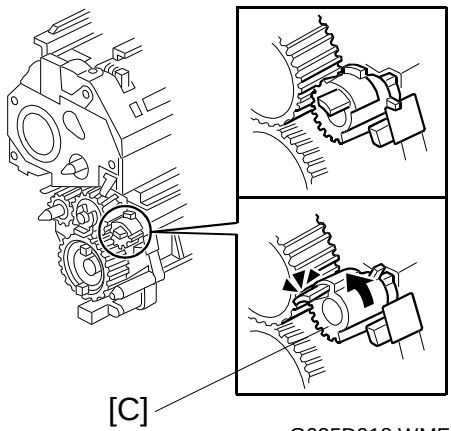
The machine leaves energy saver mode when one of the following happens.

- The print command is received from a PC
- Any key on the operation panel is pressed

2.13 NEW UNIT DETECTION MECHANISM



G035D910.WMF



G035D918.WMF

The photoconductor and development unit - maintenance kit has this detection mechanism. When this unit has been replaced, the CPU detects the new unit and automatically removes the “Change Maint. Kit” from the display and resets the maintenance counter.

The photoconductor and development unit has actuating cam [A]. The projection of the cam pushes the feeler [B] of the new unit detection sensor. After the main switch turning on, the new unit sensor turns on, then the machine recognize that the new unit was replaced. Then the machine goes in the initialize mode, the actuating cam is turned [C] by the main motor, therefore, the new unit sensor turns off. If the actuation cam turns once, it never returns the initial position.

3. INSTALLATION PROCEDURE

3.1 INSTALLATION REQUIREMENTS

3.1.1 ENVIRONMENT

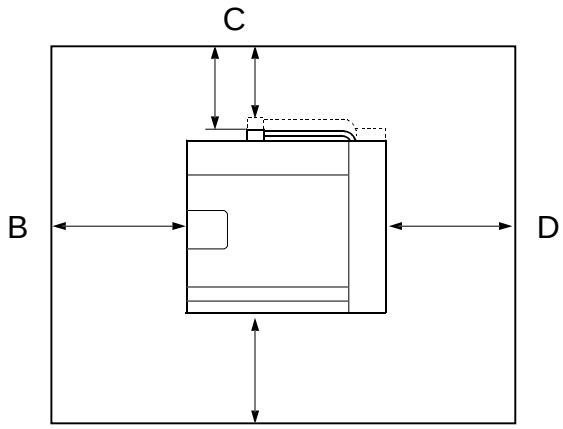
1. Temperature Range: 10°C to 30°C (50°F to 86°F)
2. Humidity Range: 15% to 90% RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m^3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10 -6 oz/yd^3)
6. Avoid an area exposed to sudden temperature changes. This includes:
   1) Areas directly exposed to cool air from an air conditioner.
   2) Areas directly exposed to heat from a heater.
7. Do not place the machine in an area where it will be exposed to corrosive gases.
8. Do not install the machine at any location more than 2,000 m (6,500 ft.) above sea level.
9. Place the printer on a strong and level base. (Inclination on any side should be no more than 5 mm.)
10. Do not place the machine where it may be subjected to strong vibrations.

3.1.2 MACHINE LEVEL

Front to back:	Within 5 mm (0.2") of level
Right to left:	With in 5 mm (0.2") of level

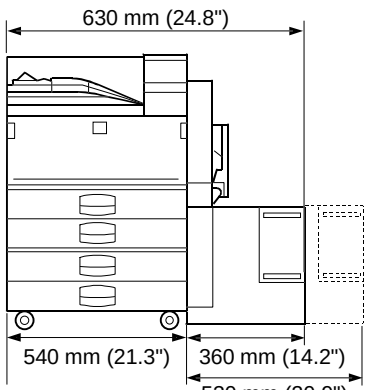
3.1.3 MINIMUM SPACE REQUIREMENTS

Place the printer near the power source, providing clearance as shown:

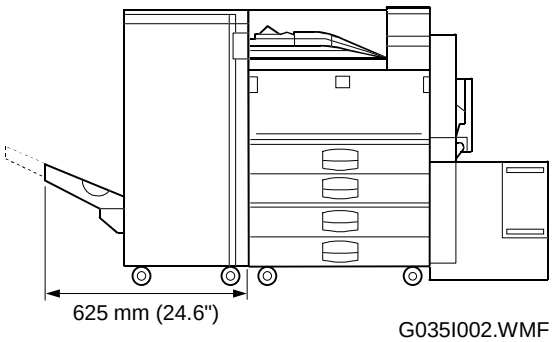


G035I000.WMF

A: In Front: >75 cm (29.6")
B: Left: > 10 cm (4")
C: To Rear: > 10 cm (4")
D: Right: > 45 cm (17.8")



G035I001.WMF



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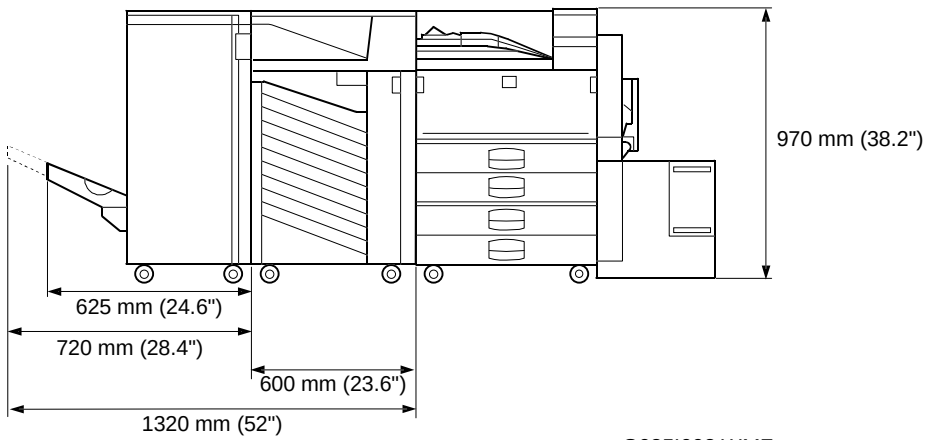


G035I003.WMF

NOTE: The 75 centimeters recommended for the space at the front is for pulling out the paper tray only. If an operator stands in front of the printer, more space is required.

3.1.4 POWER REQUIREMENTS

⚠CAUTION

1. **Make sure that the wall outlet is near the printer and easily accessible. Make sure the plug is firmly inserted in the outlet.**
2. **Avoid multi-wiring.**
3. **Be sure to ground the machine.**

1. Input voltage level: 120 V, 60 Hz: More than 10 A
   220 V ~ 240 V, 50/60 Hz: More than 6 A
2. Permissible voltage fluctuation: ±10%
3. Make sure nothing is on or presses against the power cord.

3.2 PRINTER INSTALLATION

Please refer to the Operating Instructions to install the main frame.

3.2.1 CONNECTING THE INTERFACE CABLES

Parallel Interface

An IEEE1284 compatible printer cable is required to connect the printer controller to a host PC parallel port.

Network Interface

A STP (Shielded Twisted Pair) cable with RJ45 connectors is required to connect the Network Interface Board to the computer network. (The cable should be Category/Type 5 or better.) After hardware setup, the user should do the network setup. The setup procedure is described in the NIB manual.

3.2.2 CHECKING THE CONNECTION

Connection between Printer Controller (and Related Options; DRAM SIMM, Hard Disk Drive), NIB and Engine

1. Plug in the power cord and turn on the main switch.
2. Enter the printer user mode.
   1) Press the Menu key.
   2) Press ▼ or ▲ key until LCD displays “List Print”.
3. Print out the printer configuration page.
   1) Press the “Enter #” key, and the LCD displays “Config. Page”.
   2) Press the “Enter #” key to print the configuration page. The machine automatically prints the printer configuration page.

NOTE: For more detailed information about the operation panel settings, refer to the operating instructions.

The printer configuration page is similar to that shown on the next page.

Configuration Page ***RICOH Aficio AP4500***

[A] **Reference**

Printer ID	**4H65110303**
Firmware Version	**1.73**
PCL 5e Emulation	**1.4.10**
PCL 6 Emulation	**1.1.10**
Adobe PostScript 3	**92.01**
Pages Printed	**1234567**

[D] **Memory**

Total Memory	**8192KB**
Proof Print Free Memory (%)	**100%**
Font Download Total Memory	**511840KB**
Font Download Free Memory	**505280KB**

Options [B]

Printer Hard Disk Drive	**Installed**
500x2 Sheets Paper Bank	**Installed**
Finisher 1000	**Not Installed**
Finisher 3000	**Not Installed**
Mailbox	**Not Installed**
1500 LCIT	**Not Installed**

Job Control

Paper Input	
Tray Priority	Auto
Paper Size	
Tray1	8 1/2 x 11
Tray2	A4
Tray3	8 x 13
Tray4	A3
Tray Paper Type	
Tray1	Plain Paper
Tray2	Plain Paper
Tray3	Recycled Paper
Tray4	Recycled Paper
LCT	Special Paper
Bypass Paper Type	OHP Sheet
Auto Tray SW	On
Paper Output	
Output Tray	Standard Tray
Duplex	Off
Sort	Off
Staple	Off
Punch	Off
Print Quality	
Edge Smoothing	On
Resolution	600 dpi
Image Density	Normal
Toner Saving	On
System	
Print PS Errors	Off
Energy Saver	30 minutes
Auto Continue	15 seconds
PCL Menu	
Orientation	Portrait
Form Line	60
Font Source	Internal
Font Number	0
Point Size	12.00 points
Font Pitch	10.00 pitch
Symbol Set	Roman-8

Host Interface

Printer Lang.	Auto Sense
Parallel Setup	
I/O Timeout	30 seconds
Bi-direction	Off
Network Setup [C]	
I/O Timeout	30 seconds
IP Address	133.139.174.158
Subnet Mask	255.0.0.0
Gateway Address	133.139.174.1

PCL® is a registered trademark of Hewlett-Packard Company.
Adobe® is a registered trademark of Adobe Systems Incorporated.
PostScript® is a registered trademark of Adobe Systems Incorporated.

G035I007.WMF

Check the following:

- For the printer controller, confirm that the machine prints the printer configuration page.
- For the firmware version, check “Firmware Version” [A].
- For the hard disk drive, confirm that the configuration page includes them in the “Options” section [B].
- For the NIB, confirm that the configuration page includes the “Network Setup” section [C].
- For DRAM SIMM, confirm that “Total Memory” [D] printed on the configuration page shows the correct amount of memory in the machine (including the 8 MB on board and the SIMM).

If any problem occurs with the above checks, reinstall the printer controller and other options. Then set up the machine again and redo the test.

Connection between Printer Controller and the Network Interface Board

There are two ways to check the connection between the printer controller and the network interface board.

1. Check “Network Menu” on the configuration page.
2. Check the Network Interface Board Status Sheet with the network information printed automatically after turning the power on.

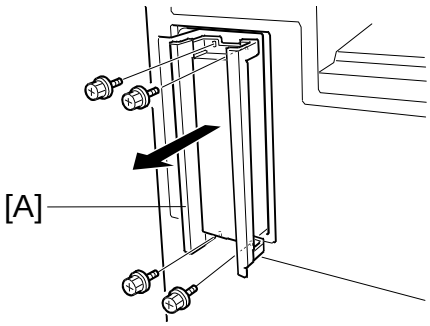
Print the Network Interface Board Status Sheet

Whenever the main switch is turned on, the machine automatically prints the network interface board status sheet.

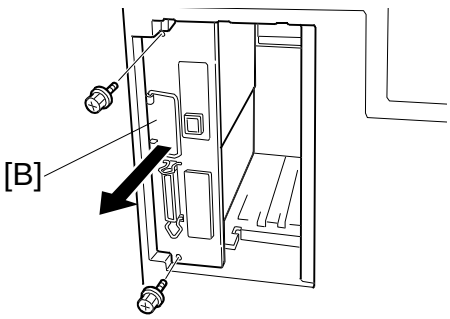
NOTE: If the machine does not print the status sheet, check the Network menu in printer user tools menu.

If any problem occurs with the above check, reinstall the printer controller and other options. Then set up the machine again and redo the test.

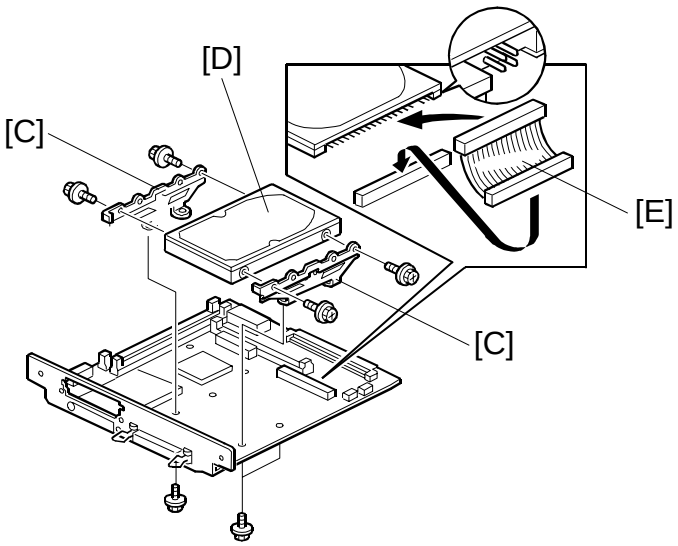
3.2.3 HARD DISK DRIVE INSTALLATION (A853)



A853I507.WMF



A853I508.WMF



A853I506.WMF

⚠CAUTION

Unplug the printer power cord before starting the following procedure.

1. Remove the cover [A] (4 screws).
2. Remove the printer controller assembly [B] (2 screws).
3. Attach the HDD brackets [C] to the hard disk drive [D] as shown (2 screws each).
4. Connect the cable [E] to the hard disk drive.
5. Attach the hard disk drive to the printer controller (4 screws, 1 connector).
6. Install the printer controller in the printer.
7. After turning on the main switch and format the hard disk using “SP 1(Controller SP) - 4 (Format Disk)”.
8. After formatting the hard disk, turn the main switch off and on.

3.3 NETWORK INTERFACE BOARD (NIB) INSTALLATION

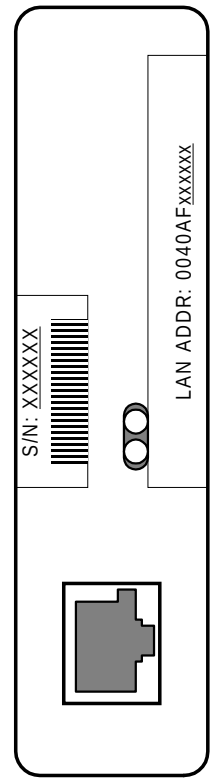
Please refer to the Operating Instructions to install the NIB.

3.3.1 SERIAL NUMBER AND MAC ADDRESS

Check the serial number and MAC (Media Access Control) address printed on the NIB.

The serial number is a 6-digit number, and is unique to each board.

The MAC address (LAN ADDR.) is a 12-digit hexadecimal number. The upper 6 digits are always “0040AF”, and the lower 6 digits are unique to each board.



G035I006.WMF

3.3.2 STATUS SHEET

By default, the NIB prints a status sheet every time after the machine is turned on or the NIB has reset itself.

NOTE: Connect a network cable to the NIB before turning on the machine or resetting the NIB. Otherwise, the machine will take several minutes to print the status sheet, and the information on it may not be accurate.

Keep the status sheet with the machine, because it has the following information.

- Unit serial number
- Firmware version
- Network (MAC) address
- Network/Protocol information

3.3.3 PROGRAMMING NETWORK/PROTOCOL PARAMETERS

This section gives summaries of how to set up a network interface board in various network environments.

NOTE: It is not recommended for service technicians to program network and protocol parameters. Ask the customer's network administrator to program and manage these parameters.

IPX Network

The following parameters are required for three types of IPX network printing. Use MAP (Management Access Program) or the NetWare Setup utility to program these parameters.

NOTE: 1) The MAP utility requires the Microsoft IPX/SPX Compatible protocol stack on Windows 9x or Windows NT4.0, and a Web browser (Microsoft Internet Explorer 3.02 or later, or any version of Netscape Navigator). The "World Wide Web Publishing service" must be stopped before starting the MAP utility on the Windows NT server desktop.
2) The NetWare Setup Utility requires the Novell 32-bit Client software on Windows 9x or Windows NT4.0.

Parameter	Peer-to-Peer Server-less Network	Novell 2.x/3.x/4.x Bindery Network	Novell 4.x NDS Network
Enable NetWare (Default = Yes)	Yes (Check the box)	Yes (Check the box)	Yes (Check the box)
Print Server Name	Yes	Yes	Yes
Print Server Password	No	Optional	Optional
Preferred File Server	No	Yes	No
Preferred NDS Context	No	No	Yes
Preferred NDS Tree	No	No	Yes
Print Queue Scan Rate (Default = 1 s)	No	Yes	Yes
Ethernet Frame Type (Default = Auto-Sense)	Yes	Yes	Yes
Disable Bindery (Default = No)	No	No (Uncheck the box)	Optional

NOTE: The preferred NDS context must be typed in without a starting dot (.).

- OU=Development.O=Corp [OK]
- .OU=development.O=Corp [NG]
- Develoment.Corp [OK]
- .Develoment.Corp [NG]

TCP/IP Network

TCP/IP Parameter Details

The following TCP/IP parameters are required for TCP/IP network printing.

Parameter	Description	How to Change Parameters		
		Operation Panel /BOOTPL	MAP/Web Browser	Telnet
IP Parameters				
IP Address	IP address of the NIB	Yes	Yes	Yes
Subnet Mask	Subnet mask for local subnet	Yes	Yes	Yes
Default Gateway	Gateway IP address	Yes	Yes	Yes
TCP Parameters				
Base Port Number	Port number to receive print jobs	No	Yes	Yes
DHCP Parameters				
Enable DHCP (Default = Yes)	**Yes** – The NIB obtains IP parameters from a DHCP server. **No** – IP parameters must be specified manually.	No	Yes	No
IP Address in NVRAM (Default = Yes)	**Yes** – Once the NIB has been assigned an IP address by a DHCP server, the NIB saves the address in the NVRAM and uses it permanently. **No** – The NIB tries to obtain IP parameters from a DHCP server every time the machine is turned on or the NIB is reset. The assigned IP address may not be the same all the time.	No	Yes	No
LPD Parameters				
Enable LPD Banner (Default = No)	Enables or disables the LPD banner	No	Yes	Yes
Available PDLs for NIC Port	Available printer languages are automatically selected.	No	Yes	Yes

Possible Problems with DHCP Parameter Settings

1. IP address conflicts with an another host
   If DHCP is enabled and an IP Address is saved in NVRAM, and the saved address conflicts with an another host, the NIB does not show any errors. As a result, the NIB cannot receive any print jobs, because the IP protocol is disabled automatically at startup.
   In this case, the other host in conflict with the NIB must have a manually assigned IP address. Find the host using the ping and arp commands for example, and assign a correct address.
2. IP address changes after restarting the machine
   If DHCP is enabled but an IP address is not saved in the NVRAM, the NIB may have a different IP address from the one before restarting the machine. As a result, the NIB cannot receive any print jobs, because the jobs are sent to the previously assigned IP address.

   There are two solutions for this problem.

   The first one is simply enable the “IP Address in NVRAM” parameter and assign a correct IP address. The second one is to reserve the IP address on the DHCP server for the NIB’s Ethernet (MAC) Address.

EtherTalk (APPLETALK) Network

The following parameters are required for AppleTalk networks. These parameters are automatically configured at startup as follows:

Parameter	Default Setting	How to change the parameter
AppleTalk Enable/Disable	Enabled	MAP, web browser and telnet.
Printer Name	Plug&Play name (SP5-907)	See Note.
Zone Name	Default zone	See Note.

NOTE: 1) The Apple LaserWriter utility can change both the printer name and the zone name. Apple Printer Utility can change the printer name only.
2) Even if the printer name and zone name are changed using a utility, the changed names will be reset to the default at the next power-on, due to NIB-to-Controller interface limitations.

3.3.4 SETUP FOR VARIOUS NETWORK TYPES

Peer-to-Peer Network

Windows for Workgroups

There is no guaranteed way to print directly to the NIB port. Share a printer connected to an LPT port on a workstation.

Windows 95/98

The Peer-to-Peer IPX and the Peer-to-Peer IP utilities install redirection to the NIB. The Peer-to-Peer IPX port appears as “RDP_xxxxx” (xxxxxx is the board’s serial number) by default.
The Peer-to-Peer IP port appears as “*IP* Address@10001”.
Both work as a local port of the host computer.

Windows NT (Workgroup Network)

In addition to Peer-to-Peer IPX and Peer-to-Peer IP printing, Windows NT supports LPR printing using TCP/IP protocol.

Use the following parameters to set up an LPR port on an NT workstation.

- Name or address of the server providing lpd: *IP Address of the NIB*
- Name of the printer or print queue on that server: PORT1 (uppercase)

After installing a printer connected to the LPR port, share the printer for other workgroup members.

Novell NetWare Network

Bindery Network

Use the NetWare Setup utility to set up everything for NetWare printing in a single procedure.

Or, use PCONCOLE to setup printers, print queues, and print servers in the server bindery, then use MAP (Management Access Program) to setup NetWare parameters in the NIB.

NOTE: 1) The NetWare Setup utility requires Novell 32-bit client on Windows 9x or NT. Also, supervisor privileges are required to perform complete setup.
2) The MAP utility requires the Microsoft IPX/SPX SPX compatible protocol stack on Windows 9x or Windows NT4.0, and a Web browser (Microsoft Internet Explorer 3.02 or later, or any version of Netscape Navigator).

NDS Network

Use the NetWare Setup utility to set up everything for NetWare printing in a single procedure.

Or, use PCONCOLE or NetWare Administrator to setup printers, print queues, and print servers in the server bindery, then use MAP (Management Access Program) to set up NetWare parameters in the NIB.

NOTE: The NIB does not support “Notification” function on NetWare NDS networks.

TCP/IP Network

LPR/LPD Printing

The NIB supports standard lpd. If a Windows or UNIX workstation has an lpr spooler, it can send print jobs to the NIB directly.

FTP Printing

The NIB can receive print jobs directly from an ftp client.

Using an Ftp Client

1. Login to the NIB as “port1” (ASCII/PCL) user name.
2. Put a file to print.

Using NetScape Navigator (Version 2.0 or Later)

1. Open one of the following addresses:
   - ftp://port1@<IP Address> (ASCII/PCL)
2. Select [File] – [Upload] to put a print file.

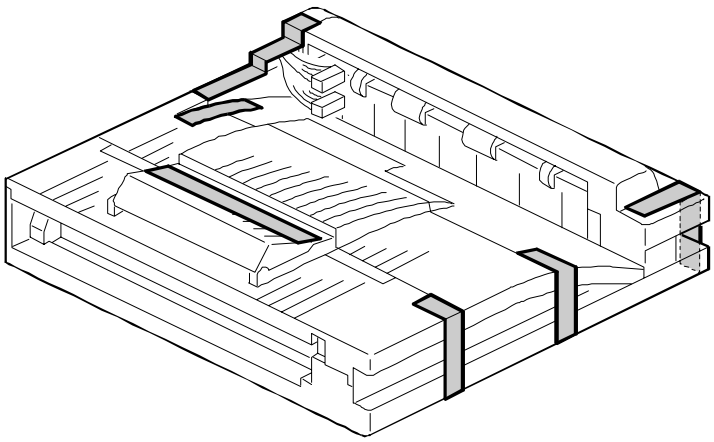
3.4 BRIDGE UNIT INSTALLATION (A688)

3.4.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Quantity
1. Stepped screw	2
2. Connector cover	1
3. Entrance mylar	2
4. Exit mylar	2
5. NECR	1
6. Installation procedure	1

3.4.2 INSTALLATION PROCEDURE

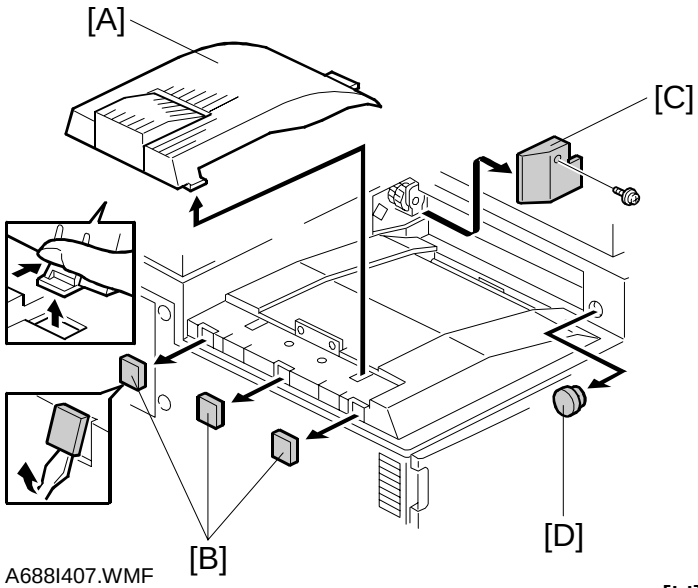


A688I401.WMF

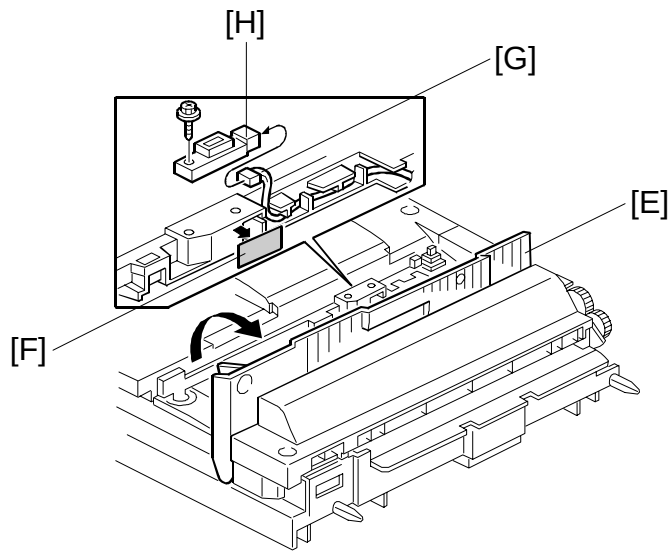
⚠CAUTION

Unplug the main machine power cord before starting the following procedure.

1. Unpack the bridge unit. Then remove the tapes.

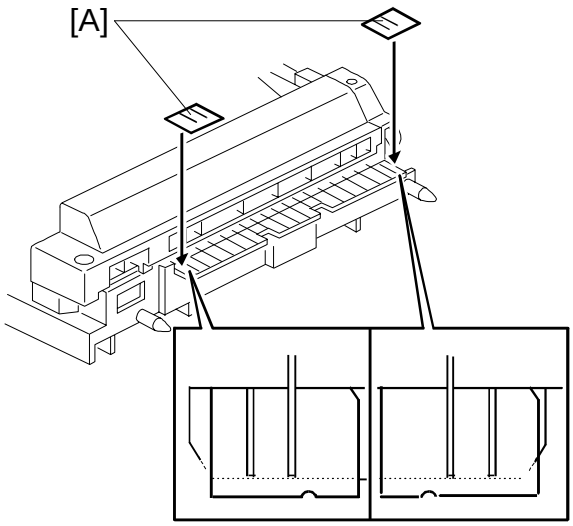


A688I407.WMF

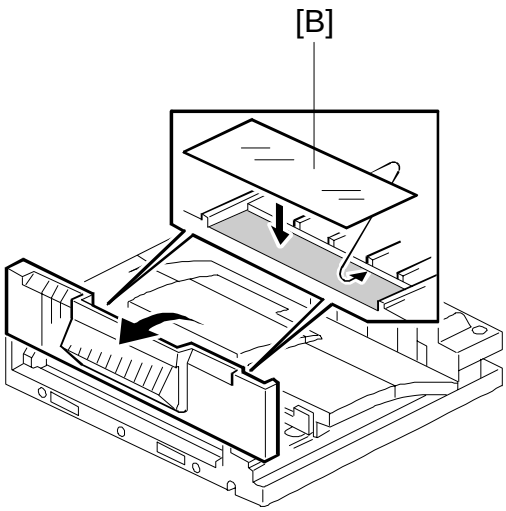


A688I517.WMF

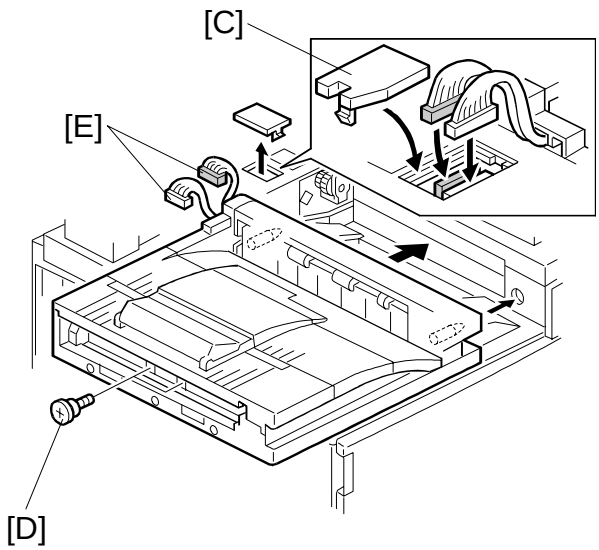
2. Remove the inner tray [A].
3. Remove three covers [B].
4. Remove the cover [C].
5. Remove the cap [D].
6. Open the right cover [E] of the bridge unit and peel off the black tape [F]; then pull out the connector [G].
7. Install the paper sensor [H] (which is packed along with the printer itself as an accessory) (1 screw, 1 connector).



A688I406.WMF



A688I402.WMF



A688I404.WMF

8. Attach two mylars [A] to the paper entrance area of the bridge unit as shown.
9. **If the optional finisher is installed:**
   Attach two mylars [B] to the bridge unit as shown.
10. Remove the cover [C].
11. Install the bridge unit (2 screws) [D].
12. Connect the bridge unit I/F harnesses [E].
13. Install the connector cover.
14. Turn on the AC switch and check the bridge unit operation.

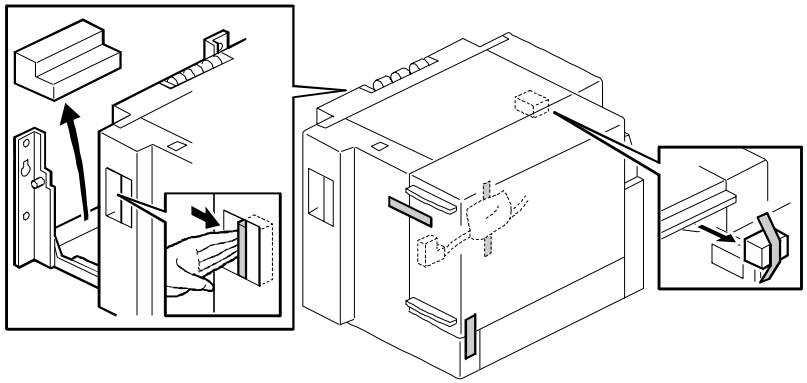
3.5 LCT INSTALLATION (A683)

3.5.1 ACCESSORY CHECK

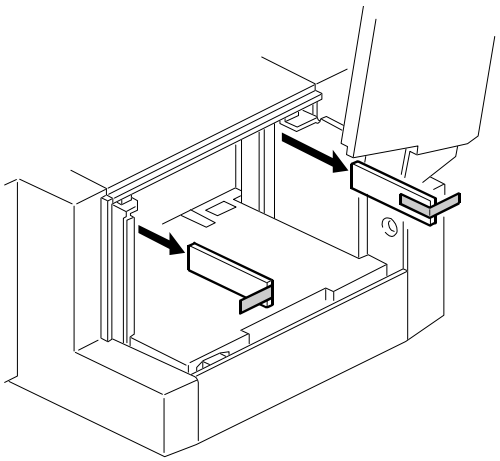
Check the quantity and condition of the accessories in the box against the following list:

Description	Quantity
1. Joint pin	2
2. Stepped screw - M3 x 18	4
3. Magnet cover	1
4. NECR (-17, -27 machines)	1
5. Installation procedure	1

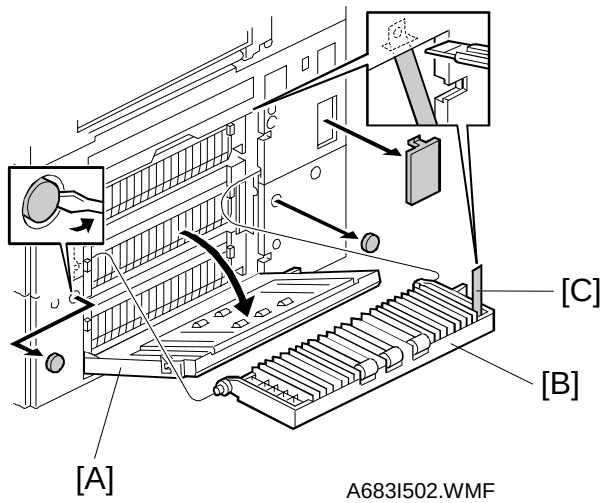
3.5.2 INSTALLATION PROCEDURE



A683I501.WMF



A683I500.WMF



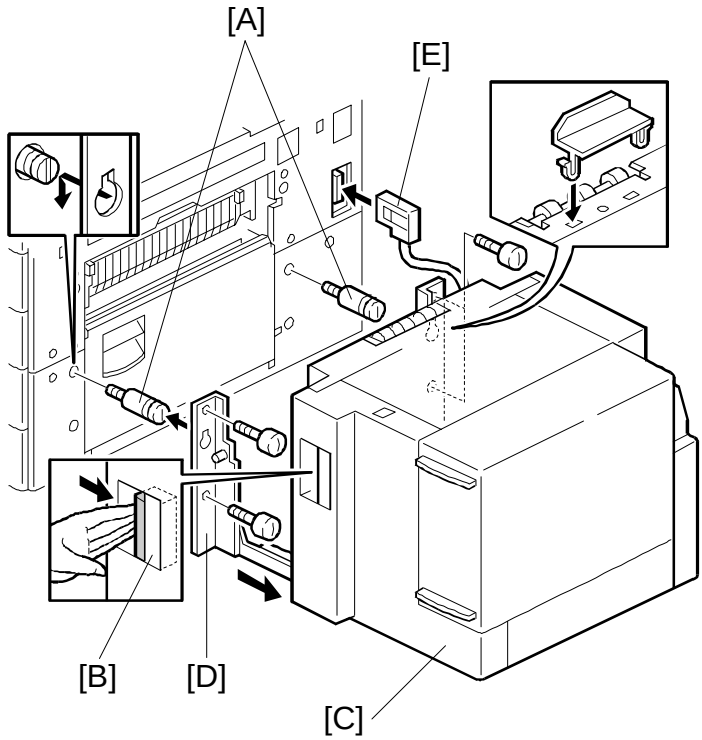
A683I502.WMF

⚠CAUTION

Unplug the main machine power cord before starting the following procedure.

NOTE: The Paper Tray Unit (G520) must be installed before installing the LCT.

1. Unpack the LCT and remove the tapes.
2. Open the right cover of the paper tray unit [A].
3. Open the lower right cover [B] and cut the holding band [C].
   NOTE: When cutting the holding band, the upper part of the band should be cut as shown. Otherwise, paper jams may occur.
4. Remove the lower right cover.



5. Install the joint pins [A].
6. Push the release lever [B] and slide the LCT to the right (front view).
7. Hang the LCT [C] on the joint pins, then secure the brackets [D] (4 screws).
8. Return the LCT to the previous position and connect the LCT cable [E].
9. Open the LCT cover and load the paper.
10. Turn on the AC switch and check the LCT operation.

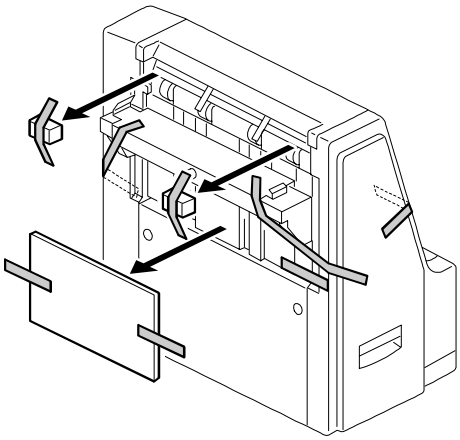
3.6 1,000-SHEET FINISHER INSTALLATION (A681)

3.6.1 ACCESSORY CHEK

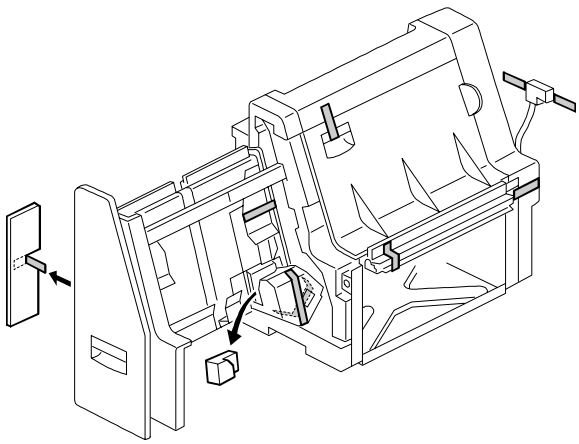
Check the quantity and condition of the accessories in the box against the following list:

Description	Quantity
1. Front stand	1
2. Rear stand	1
3. Knob screw	1
4. Screw - M4 x 12	6
5. NECR (-17, -27 machines)	1
6. Installation procedure	1

3.6.2 INSTALLATION PROCEDURE



A681I503.WMF



A681I504.WMF

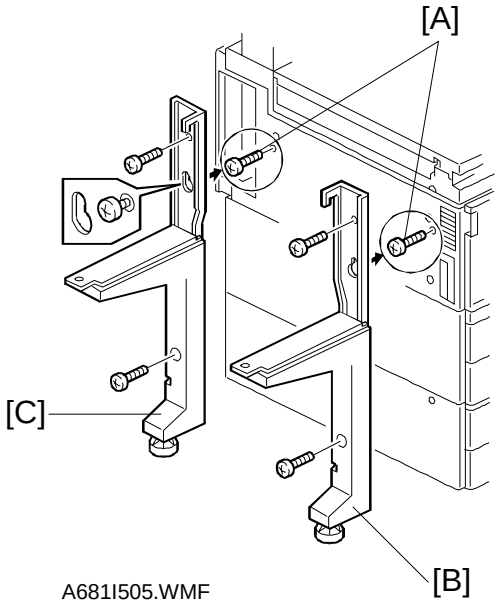
⚠CAUTION

Unplug the main machine power cord before starting the following procedure.

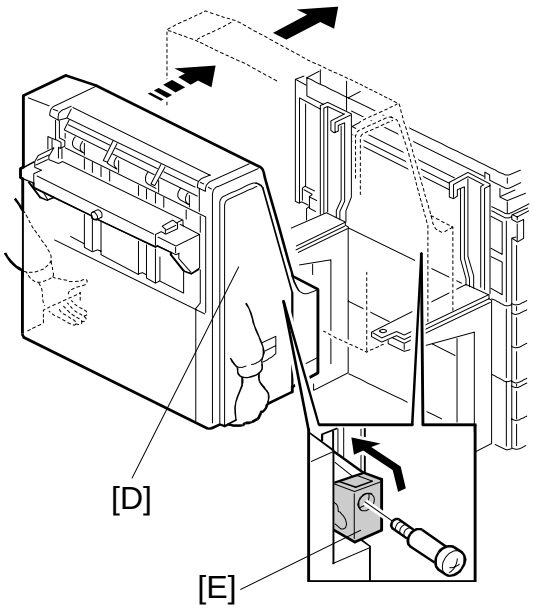
NOTE: If this finisher will be installed on the G035 printer, the following options should be installed.

- Bridge unit (A688)
- Paper tray unit (G520)

1. Unpack the finisher and remove the tapes.

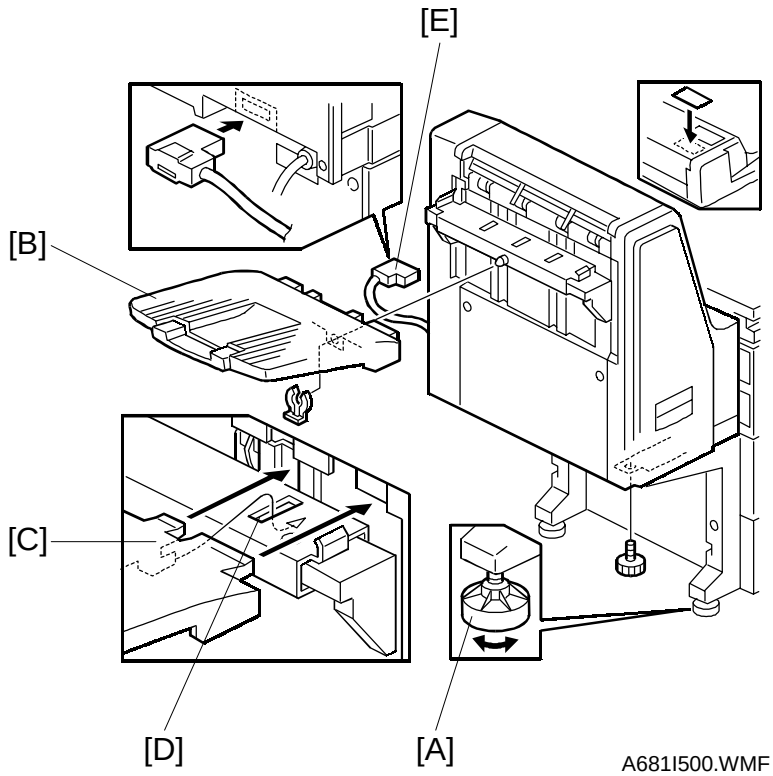


A681I505.WMF



A681I506.WMF

2. Install the two screws [A] loosely.
3. Hang the front stand [B] and rear stand [C] on the screws that were installed in step 2.
4. Secure the front and rear stands (6 screws, including the two screws [A]).
5. Pull out the stapler unit [D].
6. Draw out the locking lever [E] (1 screw).
7. Align the finisher on the stands, and lock it in place by pushing the locking lever.
8. Secure the locking lever (1 screw) and push the stapler unit into the finisher.



9. Secure the finisher (1 screw).
10. Adjust the securing knobs [A] under the front and rear stand until the finisher is perpendicular to the floor.
11. Install the shift tray [B] (1 snap ring).
    NOTE: Make sure that the three pegs [C] fit into the slots [D] properly.
12. Connect the finisher cable [E] to the main machine.
13. Turn on the AC switch and check the finisher operation.

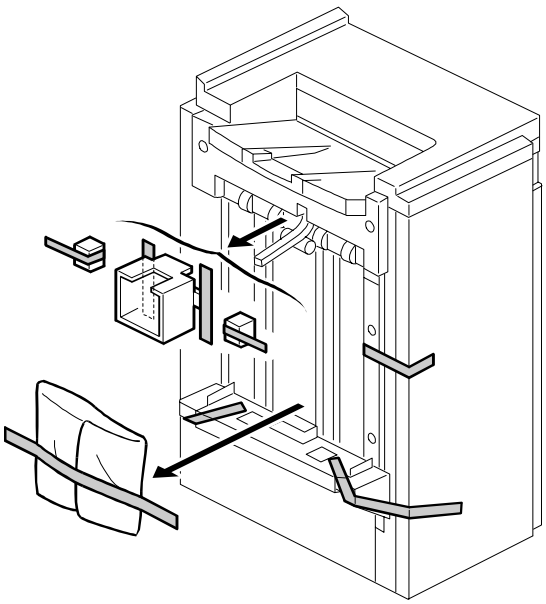
3.7 3,000-SHEET FINISHER INSTALLATION (A697)

3.7.1 ACCESSORY CHECK

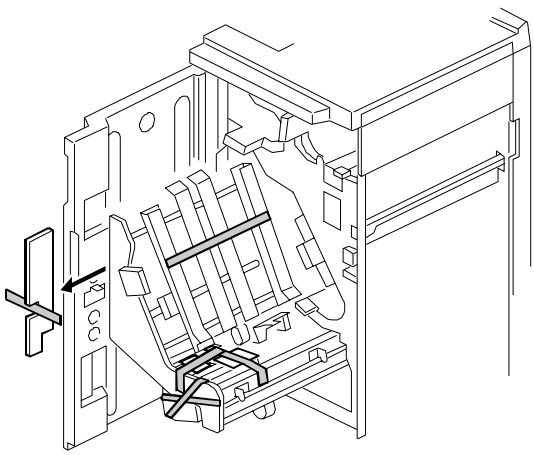
Check the quantity and condition of the accessories in the box against the following list:

Description	Quantity
1. Front joint bracket	1
2. Rear joint bracket	1
3. Entrance guide plate	1
4. Shift tray	1
5. Shift tray guide	1
6. Staple position decal	1
7. Screw - M3 x 6	2
8. Screw - M4 x 14	4
9. Screw - M3 x 8	4
10. Cushion	1
11. Upper grounding plate	1
12. Lower grounding plate	2
13. NECR (-17 machine)	1
14. Installation procedure	1

3.7.2 INSTALLATION PROCEDURE



A697I506.WMF



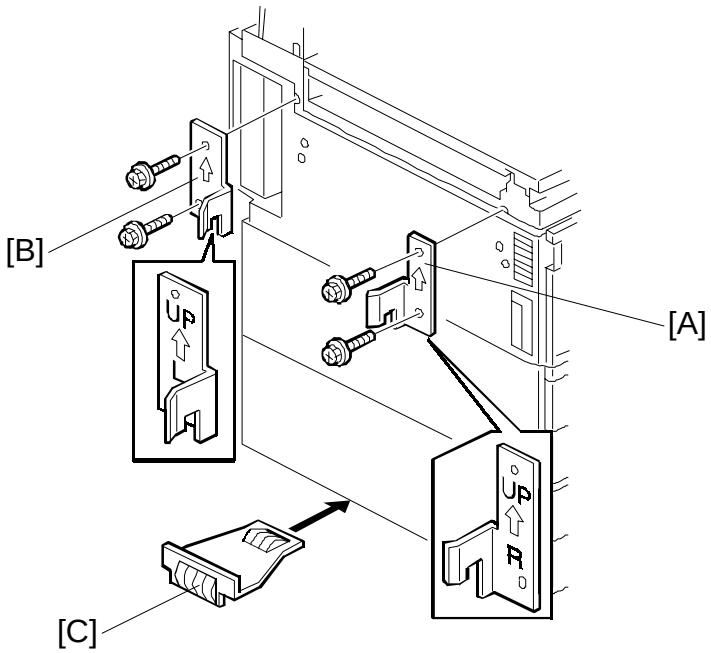
A697I507.WMF

⚠CAUTION

Unplug the main machine power cord before starting the following procedure.

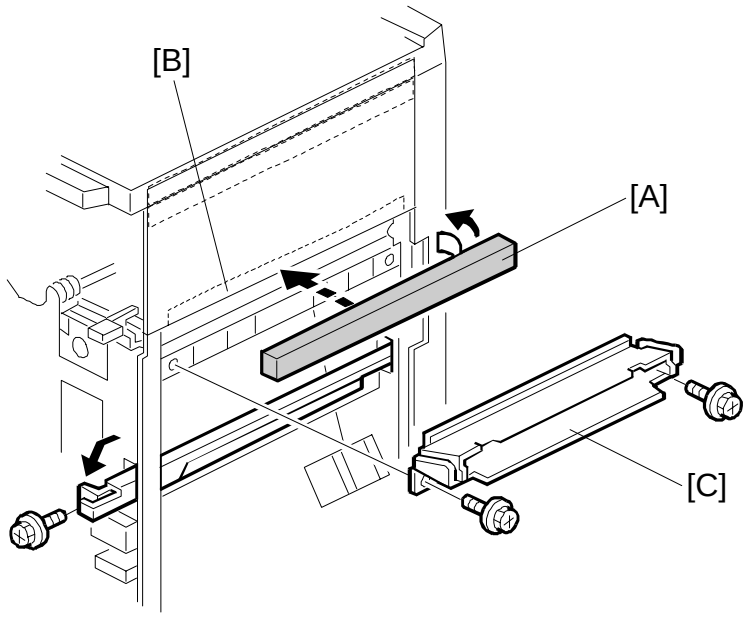
NOTE: To install this finisher with the printer, the bridge unit (A688) and paper tray unit (G520) must be installed.

1. Unpack the finisher and remove the tapes.



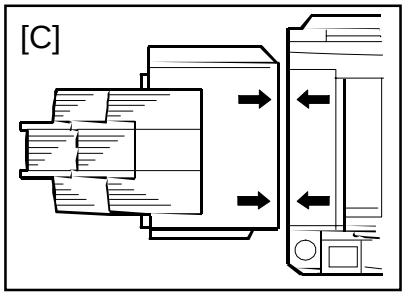
A697I558.WMF

2. Install the front joint bracket [A] and rear joint bracket [B] (2 screws each).
3. Peel off the backing of the double-sided tape that is attached to the lower grounding plate [C].
4. Attach one lower grounding plate to the center position of the paper tray unit as shown.

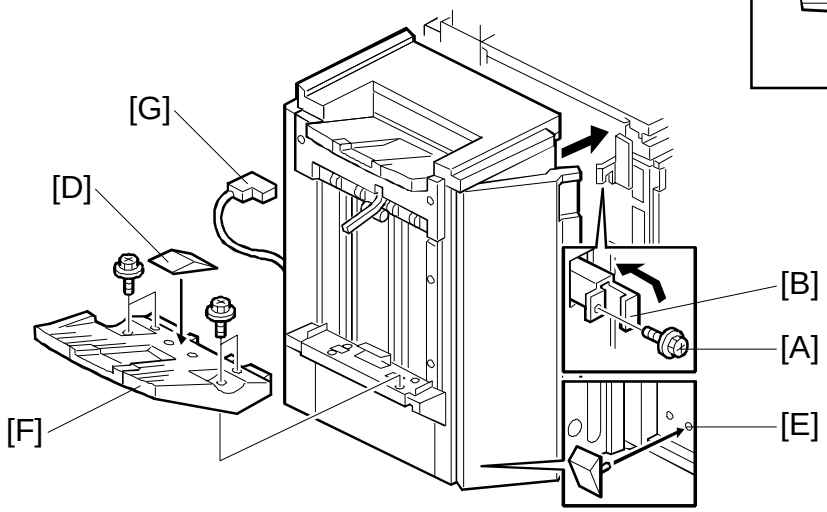


A697I559.WMF

5. Attach the cushion on the position [B].
6. Install the entrance guide plate [C] (2 screws).



A697I534.WMF



A697I550.WMF

7. Open the front door of the finisher, and remove the screw [A] that secures the locking lever [B]. Then pull the locking lever.
8. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
   NOTE: Before securing the locking lever, make sure that the top edges of the finisher and the copier are parallel from front to rear as shown [C].
9. Secure the locking lever (1 screw) and close the front door.
10. Install the shift tray guide [D] on the shift tray. If the customer does not wish to install it on the shift tray, store it at the location [E].
    NOTE: The shift tray guide helps to properly stack exiting paper.
11. Install the shift tray [F] (4 screws).
12. Connect the finisher cable [G] to the main machine.
13. Turn on the main power switch and check the finisher operation.

3.8 MAILBOX INSTALLATION (G909)

3.8.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

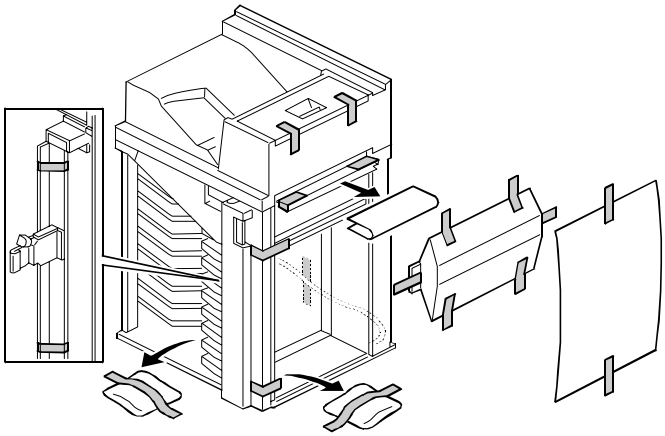
Description	Quantity
1. Front joint bracket	1
2. Rear joint bracket	1
3. Exit guide mylar	1
4. Proof tray attachment	1
5. Upper grounding plate	1
6. Lower grounding plate	2
7. Cushion	1
8. Tapping screw - M4 x 14	4
9. Bin decals	1
10. Installation procedure	1

3.8.2 REQUIREMENT OPTIONS FOR MAIN MACHINE

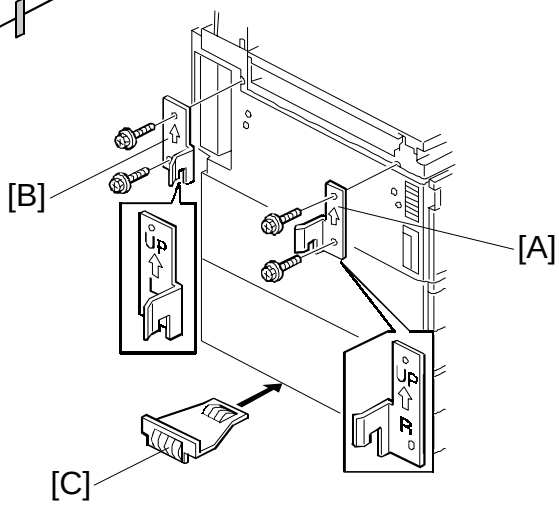
When the mailbox is going to be installed with the printer, the following options for main machine must be required.

- Bridge unit type 450 (A688)
- Paper tray unit - PS430 (G520)

3.8.3 INSTALLATION PROCEDURE



G909I500.WMF



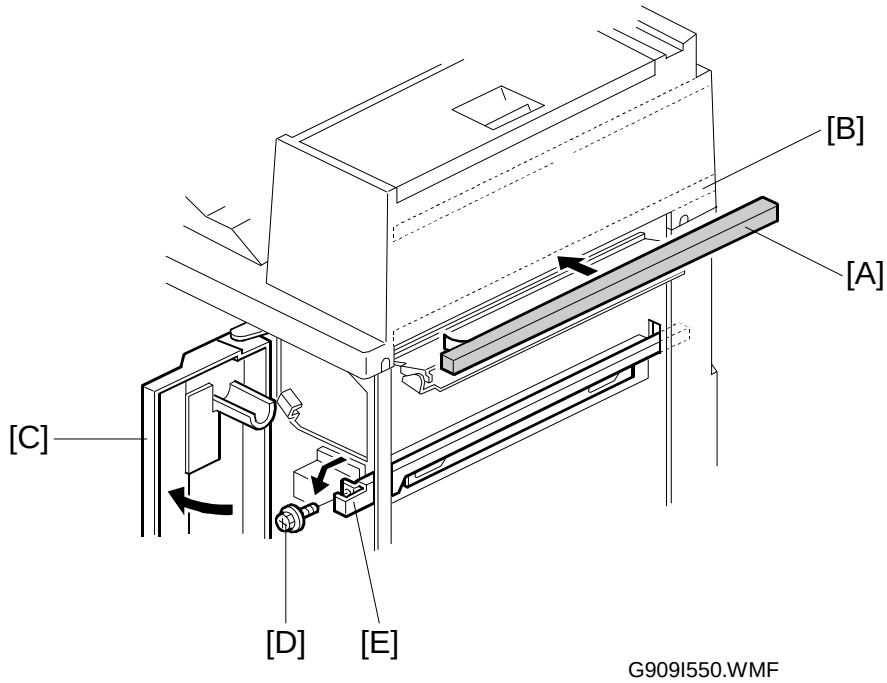
G909I559.WMF

⚠CAUTION

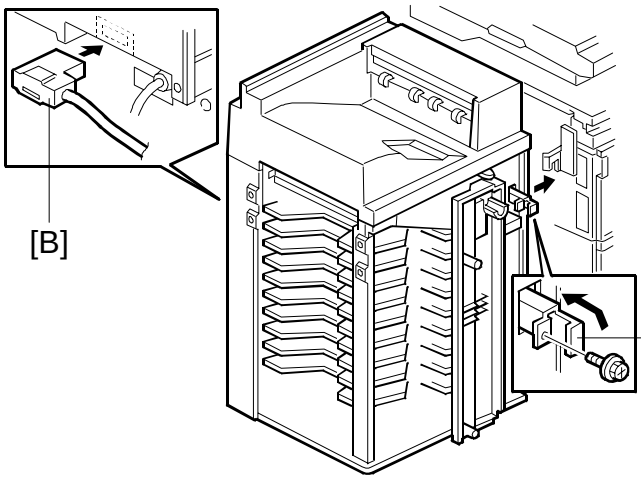
Unplug the main machine power cord before starting the following procedure.

NOTE: 1) After installing the finisher (A697) on the machine, the bridge unit for the mailbox (G912) must be installed.
2) The bridge unit for the mailbox must be installed before installing this unit on the main machine.

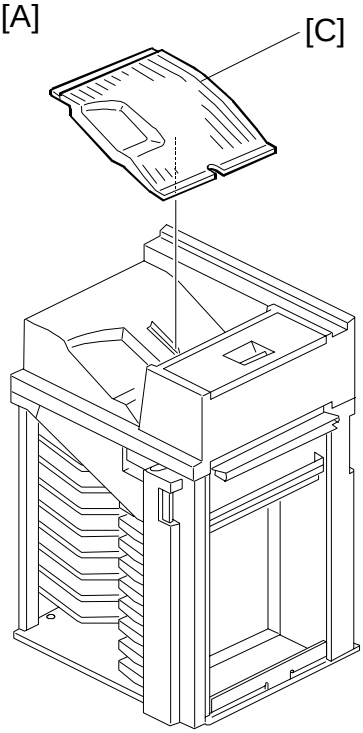
1. Unpack the finisher and remove the pieces of tape.
2. Attach the front joint bracket [A] and rear joint bracket [B] to the main machine (2 screws each).
3. Peel off the backing of the double-sided tape that is attached to the lower grounding plate [C].
4. Attach one lower grounding plate to the center of the bottom edge of the paper tray unit as shown.



5. Attach the cushion to the position [B].
6. Open the front cover [I] of the mailbox, and remove the screw [J] that secures the locking lever [K]. Then pull the locking lever.



G909I503.WMF



G909I552.WMF

7. Align the mailbox on the joint brackets, and lock it in place by pushing the locking lever [A].
8. Secure the locking lever (1 screw) and close the front door.
9. Connect the mailbox cable [B] to the main machine.
10. Peel off the backing of the double-sided tape that is attached to the proof tray attachment [C].
11. Install the proof tray attachment on the proof tray.
12. Turn on the main switch and check the mailbox operation.

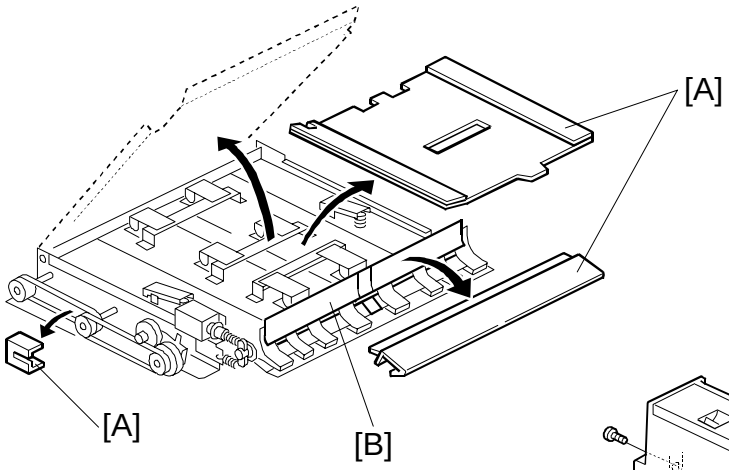
3.9 BRIDGE UNIT FOR MAILBOX INSTALLATION (G912)

3.9.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Quantity
1. Guide plate bracket	1
2. Cable	1
3. Cover switch	1
4. Grounding bracket	1
5. Finisher shielding plate	1
6. Screw - M4 x 8	9
7. Screw - M4 x 4	4
8. Screw - M3 x 6	2

3.9.2 INSTALLATION PROCEDURE



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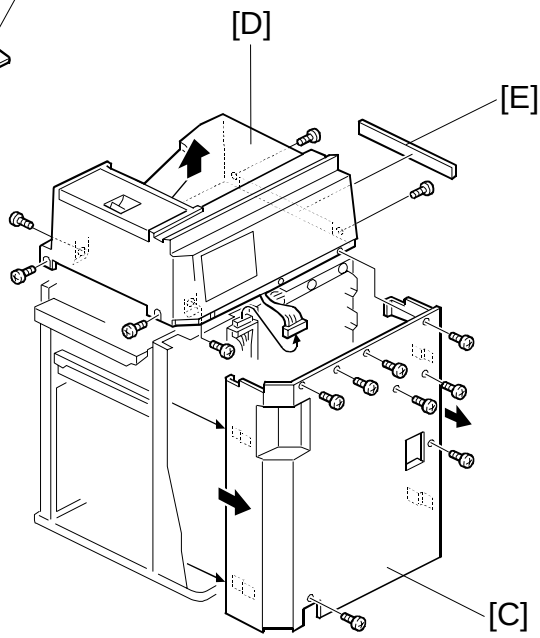


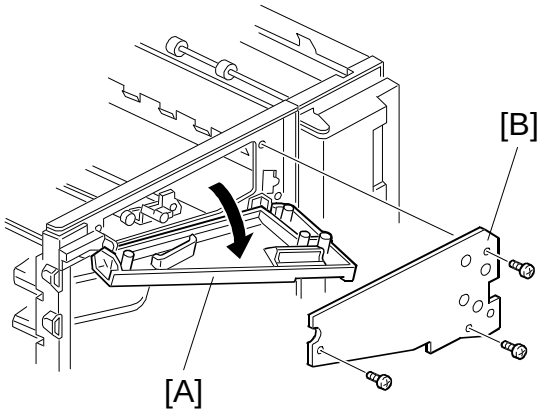
G909I508.WMF

⚠CAUTION

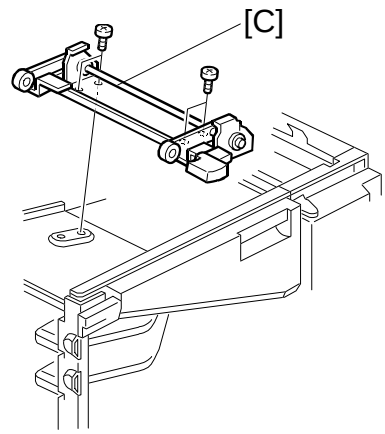
Unplug the main machine power cord before starting the following procedure.

NOTE: The bridge unit for the mailbox must be installed when the 3000 sheet finisher (A697) will be installed.

1. Unpack the bridge unit and remove the shipping retainers [A].
   NOTE: Do not remove the protective sheet [B] at this time.
2. Remove the mailbox if it has been installed.
3. Remove the rear cover [C] of the mailbox (8 screws).
4. Remove the proof tray unit [D] (6 screws, 1 connector).
5. Remove the cover [E].



G912I503.WMF



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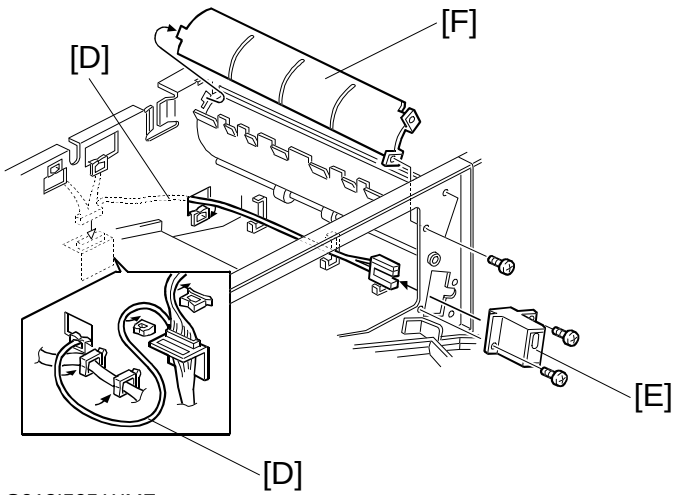
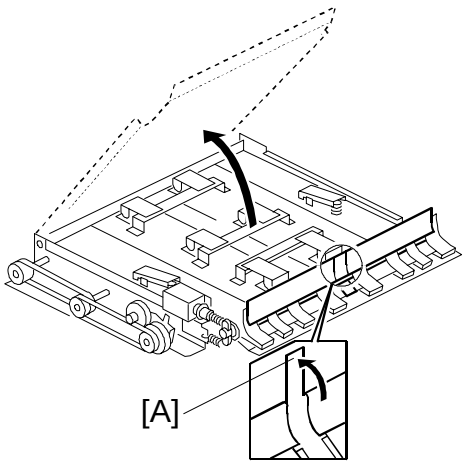
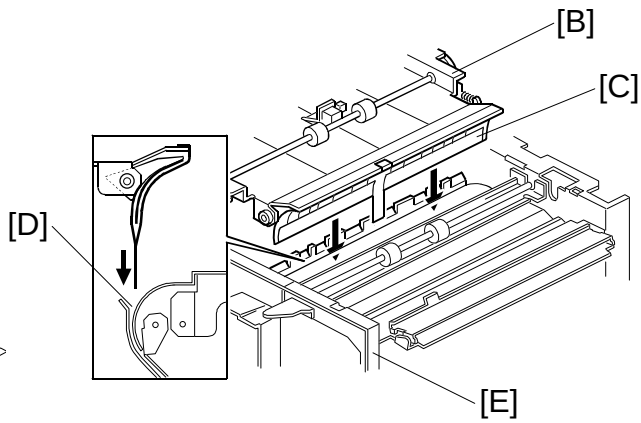


G912I505.WMF

6. Open the left front cover [A] of the mailbox, and remove the inner plate [B] (3 screws).
7. Install the guide plate bracket [C] (4 screws - M4 x 4).
8. Route the cable [D] and clamp it as shown.
9. Connect the cover switch [E] to the cable then install the cover switch (2 screws - M4 x 8).
10. Remove the paper guide plate [F] (2 screws).



G912I501.WMF



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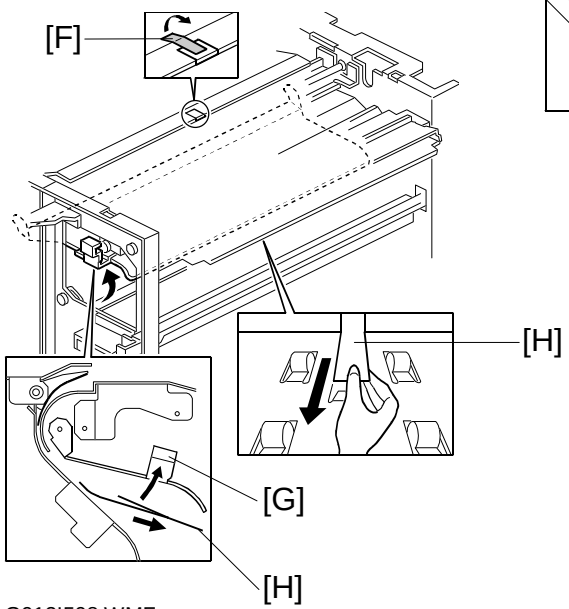
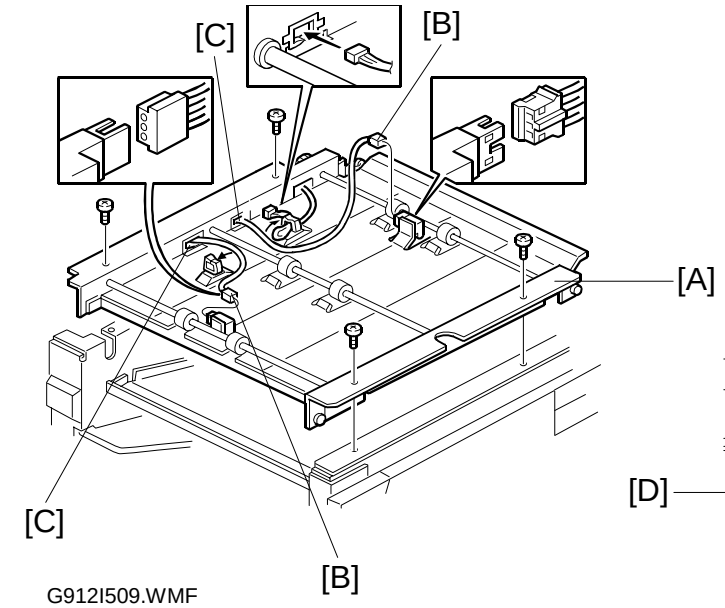
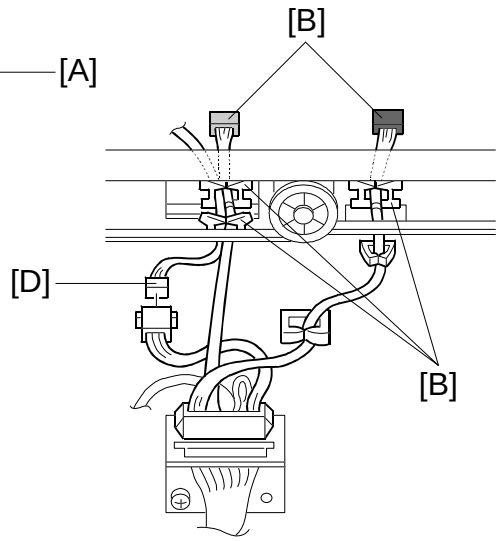


G912I508.WMF

11. Pull up the tab [A] of the protective sheet.
    NOTE: 1) Do not remove the protective sheet at this time.
    2) Make sure that all mylars are held between the two folded halves of the protective sheet.
12. Turn over the bridge unit [B] and insert the protective sheet [C] into the gap [D] between the paper guides, then put the bridge unit on the mailbox [E].
    NOTE: When holding the bridge unit, do not touch the timing belt. Otherwise the timing belt may come off the gear.
13. Remove the tape [F] for the protective sheet.
14. Open the upper paper guide [G] then pull out the protective sheet [H].
    NOTE: Check that all mylars are set into the gap between the paper guides.



G912I509.WMF



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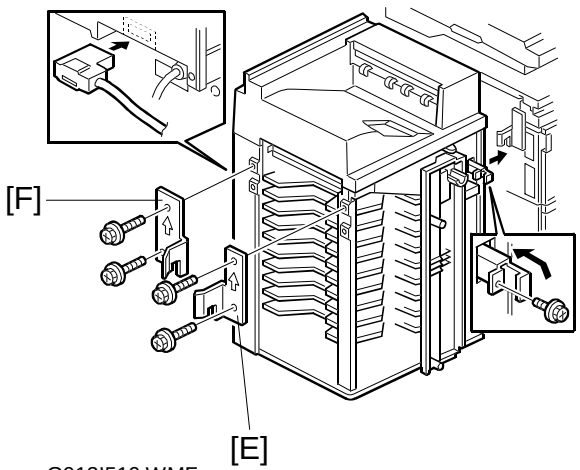
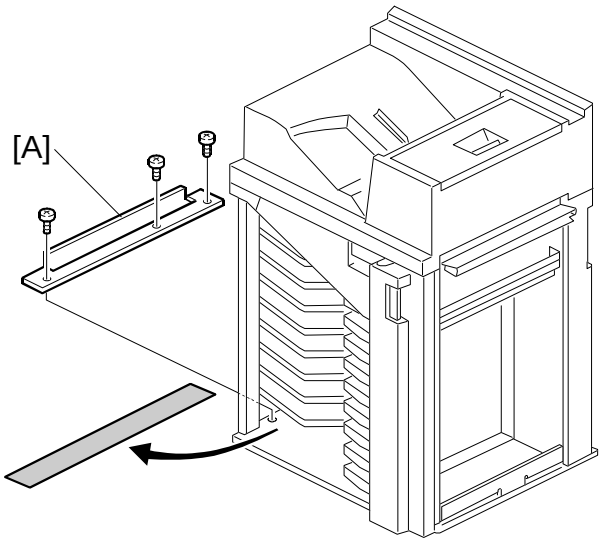


G912I510.WMF

15. Secure the bridge unit [A] (4 screws - M4 x 8).
16. Route the cables [B] through the openings [C].
17. Route the solenoid harness [D] through the opening [C].
18. Connect the cables to the solenoid and sensors and clamp the cable as shown.
19. Reinstall the rear cover and proof tray unit.
20. Install the mailbox on the main machine (refer to the Mailbox Installation procedure for more detail).

When the 3,000-sheet finisher (A697) is going to be installed, do steps 21 to 25.

21. Install the front joint bracket [E] and rear joint bracket [F] which are contained in the finisher's accessory box.



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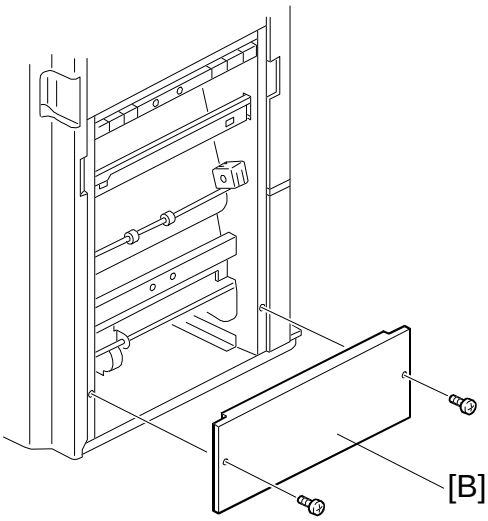


G912I512.WMF

22. Remove the seal [A].
23. Attach the grounding bracket [B] (3 screws - M4 x 8).
24. Attach the shielding plate [C] to the finisher (2 screws - M3 x 8).
25. Attach the finisher to the mailbox (refer to the finisher installation procedure).
26. Turn on the main switch of the main machine and check the bridge unit operation. (Select a print mode that uses the finisher.)

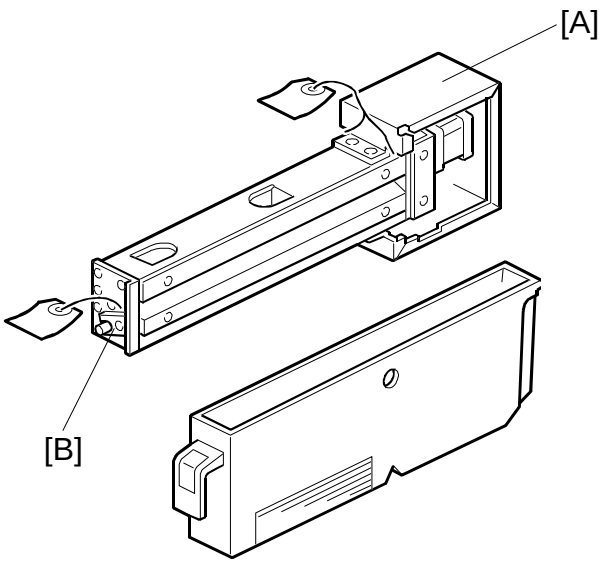
3.10 PUNCH UNIT INSTALLATION

3.10.1 ACCESSORY CHECK

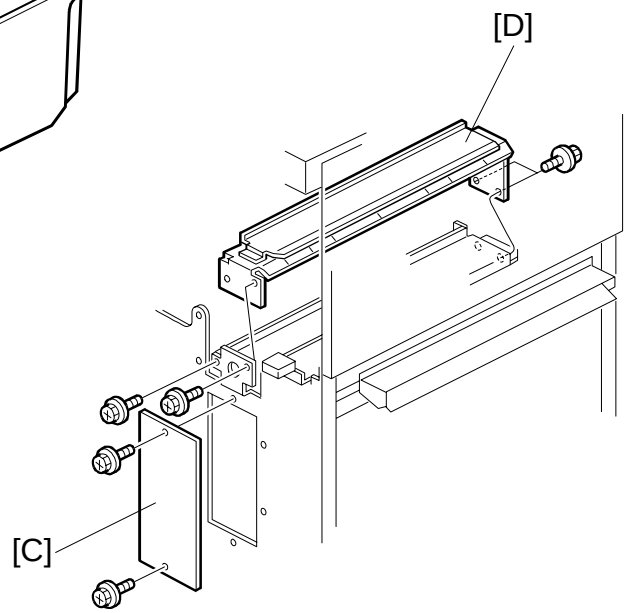
Check the quantity and condition of the accessories in the box against the following list:

Description	Quantity
1. Spacer - 2 mm	1
2. Spacer - 1 mm	2
3. Stepped screw - Short	1
4. Stepped screw - Long	1
5. Punch unit knob	1
6. Spring	1
7. Harness - Long	1
8. Harness - Short	1
9. Hopper	1
10. Punch position decal	1
11. Tapping screw - M4 x 10	2
12. Screw with flat washer - M4 x 6	1
13. NECR	1

3.10.2 INSTALLATION PROCEDURE



G035I761.WMF

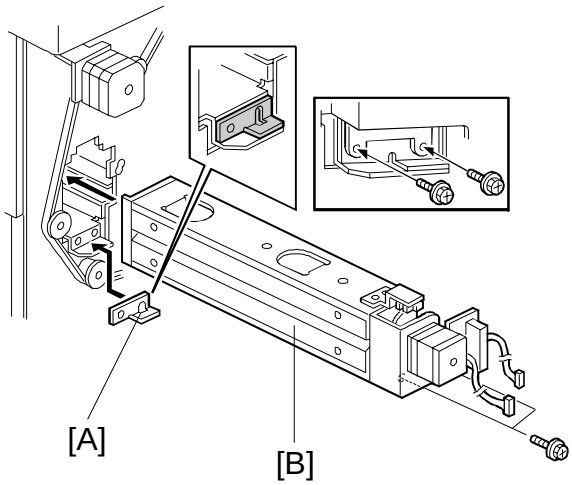


G035I763.WMF

⚠CAUTION

Unplug the copier power cord and remove the 3,000-sheet finisher from the copier before starting the following procedure.

1. Unpack the punch unit and remove the shipping retainers [A] (4 screws) and [B] (1 screw).
2. Open the front door and remove the hopper cover [C] (2 screws).
3. Remove the finisher rear cover (2 screws) and remove the transport guide plate [D] (4 screws).



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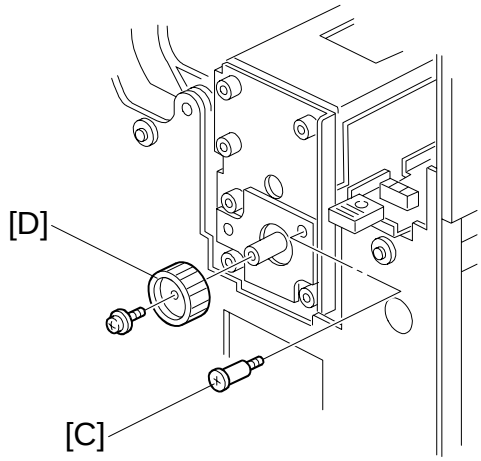

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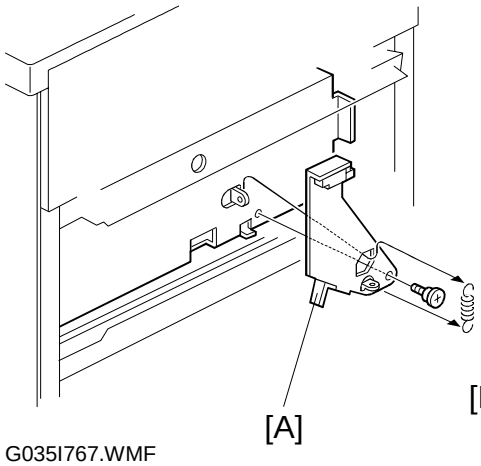
4. Install the spacer [A] (thickness = 2 mm).
   NOTE: There are three spacers in the accessory box. Do not lose the other two spacers (1-mm) because they are used for adjusting the punch hole position.
5. Install the punch unit [B] and secure it with a long stepped screw [C].
6. Install the punch unit knob [D] (1 screw).
7. Secure the rear of the punch unit (2 screws).



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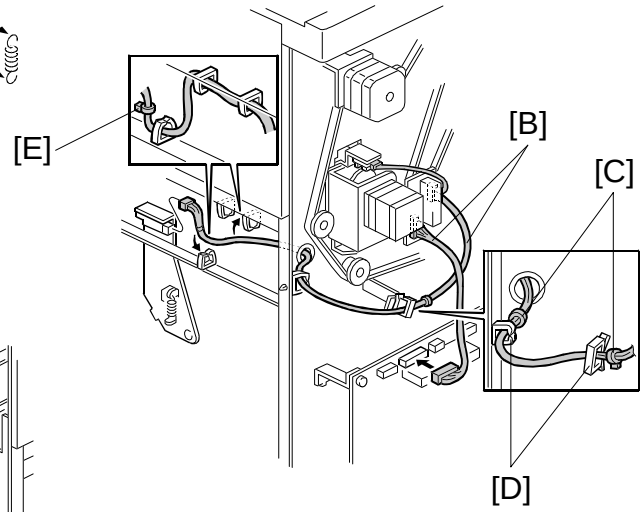

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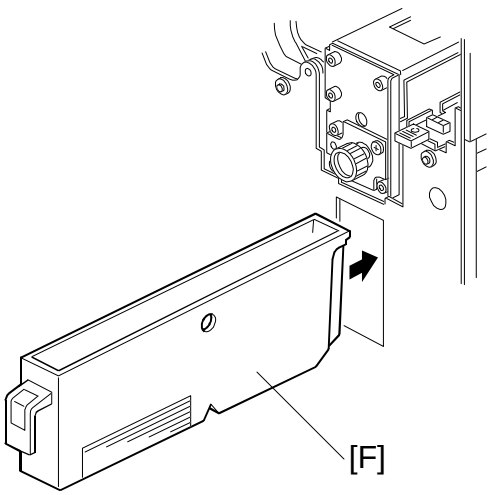

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8. Install the sensor bracket [A] (1 short stepped screw, 1 spring).
9. Connect the harnesses [B].

NOTE: 1) The harness binders [C] must not be between the harness clamps [D].
2) The harness binder [E] must be positioned to the left of the harness clamp.

10. **When a three-punch-hole unit is installed:** Turn on switch 1 of DIP SW 100 on the finisher control board.
11. Slide the hopper [F] into the finisher.
12. Reassemble the finisher and attach the 3,000-sheet finisher to the copier, then check the punch unit function.

4. SERVICE TABLES

4.1 GENERAL CAUTIONS

Do not turn off the either of the power switches while any of the electrical components are active. Doing so might cause damage to units such as the transfer belt, drum, and development unit when they are pulled out of or put back into the copier.

4.1.1 DRUM

An organic photoconductor (OPC) drum is more sensitive to light and ammonia gas than a selenium drum. Follow the cautions below when handling an OPC drum.

1. Never expose the drum to direct sunlight.
2. Never expose the drum to direct light of more than 1,000 Lux for more than one minute.
3. Never touch the drum surface with bare hands. When the drum surface is touched with a finger or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with wet cotton.
4. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
5. Store the drum in a cool, dry place away from heat.
6. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
7. Never expose the drum to corrosive gases such as ammonia gas.
8. Always keep the drum in the protective sheet when keeping the drum unit, or the drum itself, out of the copier. Doing so avoids exposing it to bright light or direct sunlight, and will protect it from light fatigue.
9. Before pulling out the PCU, place a sheet of paper under the PCU to catch any spilt toner.
10. Dispose of used drums in accordance with local regulations.
11. When installing a new drum in the PCU, the following must be done in the stated order.
    1) Remove the protective sheet after securing the new drum in the drum unit.
    2) Make sure that the charge roller voltage supply is at the standard value (SP2-5-1).
    3) Do the ID Sensor Initial Setting procedure (SP2-14).
12. When installing the PCU, make sure that the PCU is set in the machine properly.

4.1.2 TRANSFER BELT UNIT

1. Replace the transfer belt every PM cycle (150 K sheets printed) to avoid bad effects on the drum.
2. Never touch the transfer belt surface with bare hands.
3. Take care not to scratch the transfer belt as the surface is easily damaged.
4. Before installing the new transfer belt, clean all the rollers and the inner part of the transfer belt with a dry cloth to prevent the belt from slipping.

4.1.3 LASER UNIT

1. Do not loosen the screws that secure the LD drive board to the laser diode casing. Doing so would throw the LD unit out of adjustment.
2. Do not adjust the variable resistors on the LD unit, as they are adjusted in the factory.
3. The polygon mirror and F-theta lenses are very sensitive to dust. Do not open the optical housing unit.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.
5. After replacing the LD unit, do the laser beam pitch adjustment. Otherwise, an SC condition will be generated.

4.1.4 CHARGE ROLLER

1. Do not touch the charge roller with bare hands. Oil stains from fingers may cause uneven image density on copies.
2. Clean the charge roller with alcohol and water, then with a dry cloth

4.1.5 DEVELOPMENT

1. Be careful not to nick or scratch the development roller.
2. Place the development unit on a sheet of paper after removing it from the copier.
3. Never disassemble the development roller assembly. The position of the doctor plate is set with special tools and instruments at the factory to ensure the proper gap between the doctor blade and the development roller.
4. Clean the drive gears after removing used developer.
5. Dispose of used developer in accordance with local regulations.

6. Never load different types of developer and toner into the development unit. Doing so will cause poor copy quality and toner scattering.
7. Immediately after installing new developer, the TD sensor initial setting procedure should be performed to avoid damage to the copier. Do not perform the TD sensor initial setting with used developer. Do not make any copies before doing the TD sensor initial setting.
8. When using a vacuum cleaner to clean the development unit casing, always ground the casing with your fingers to avoid damaging the toner density sensor with static electricity.
9. After replacing the TD sensor, do the TD sensor initial setting procedure (SP2-10).

4.1.6 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that it is movable.
2. Be careful not to damage the edges of the hot roller strippers or pressure roller strippers, or their tension springs.
3. Do not touch the fusing lamp and rollers with bare hands.
4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

4.1.7 PAPER FEED

1. Do not touch the surface of the pick-up, feed, and separation rollers.
2. The side fences and end fence of the paper tray must be positioned correctly to align with the actual paper size to avoid paper misfeeds.

4.1.8 USED TONER

1. The used toner in the transfer belt unit should be emptied at every PM cycle, but we recommend checking the amount of used toner at every EM.
2. Dispose of used toner in accordance with local regulations. Never throw toner into an open flame, for toner dust may ignite.

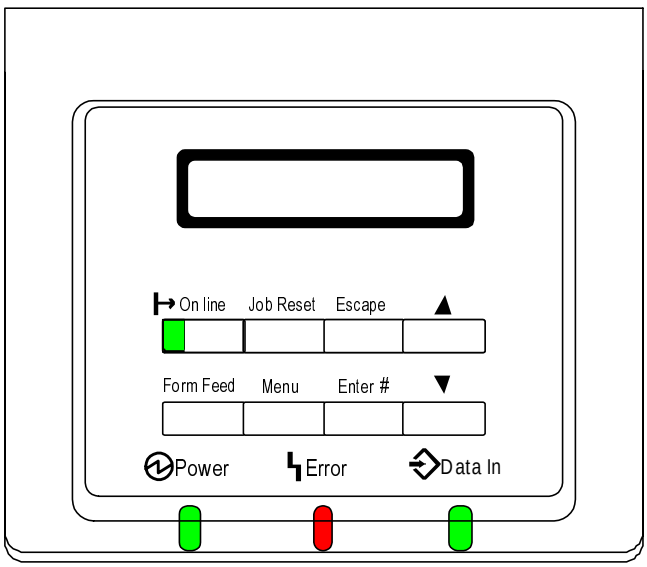
4.2 SERVICE PROGRAM MODE

4.2.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

Operation Panel

Please refer to the illustrations for the key names and their locations.



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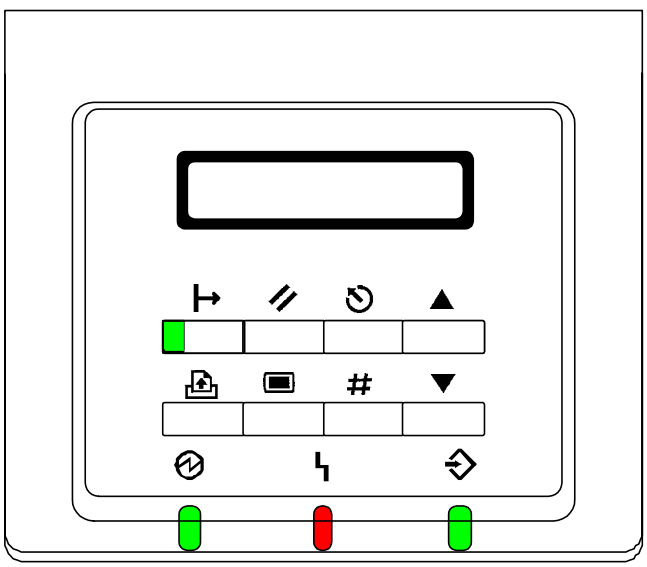


G035M006.WMF

Service Program Access Procedure

Entering the Service Mode

1. Turn the machine on while pressing the [Online] key and [Escape] key together until the service mode appears on the display.
2. Use the ▼ or ▲ key to scroll through the menu listing. To select an item, press the [Enter] key. Then the sub menu will appear.
3. To return to the previous menu, press the [Escape] key.

Exiting the Service Mode

There are two ways to exit the service mode.

1. Turning off and on
   1) Turn off the machine.
   2) Wait for a few seconds and then turn it on again. The machine is into the initializing mode then goes to ready.
2. [On Line] key
   1) Press the [On line] key.
   2) Wait a few seconds, The machine exits service mode automatically.
   3) The printer starts to initialize.

Accessing the Required Program

Select each program level in sequence.

1. Scroll through the 1st level programs using the ▼ or ▲ key. Then press the “Enter #” key.
2. Scroll through the items in the next lowest level using the ▼ or ▲ key. To go back to a higher level, press the “Escape” key.

Inputting a Value or Setting for a Service Program

1. Enter the required program mode.
   NOTE: The setting appearing initially on the display is the current setting.
2. Select the required setting using the ▲ key (increase) or the ▼ key (decreasing), then press the “Enter” key.
   NOTE: The previous value remains if the “Enter” key is not pressed.
3. Exit service mode.

4.2.2 SERVICE PROGRAM MODE TABLES

NOTE: 1) In the Function column, comments are in italics.
2) In the Settings column, the default value is in bold letters.

1. Controller SP

Menu			Function
Menu Level 2	Menu Level 3		
1	1	Flash SYS From Parallel	Downloads the printer controller firmware from a PC through the parallel port.
	2	Flash SYS From PCMCIA	Downloads the printer controller firmware using an IC card through the PCMCIA port.
2	1	Flash PS From Parallel	Downloads the PostScript firmware from a PC through the parallel port.
	2	Flash PS From PCMCIA	Downloads the PostScript firmware using an IC card through the PCMCIA port.
3		Copy ROM	Copies the printer controller firmware between ROM DIMM and printer controller
4		Format Disk	Formats the hard disk drive
5		Print Job Log	Prints the print/job count log page
6		Print Err Log	Prints the printer error log page
7		Clear Job Log	Clears the print/job counter
8		Clear Err Log	Clears the error log counter
9		Loop Back	Performs the parallel loop back test

2. Engine SP

Menu			Function	Settings [Default]
Menu Level 2	Menu Level 3			
1	1	Leading Edge Registration	Adjusts the printing leading edge registration using the trimming area pattern (SP2-12, No.).	+9.0 ~ –9.0 0.1 mm/step [+3.0 mm]
			Use the ▲ or ▼ key to toggle between + and – before entering the value. The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustments" for details on SP2-1 and 2-2.	
	2	Side-to-Side Registration (Tray 1)	Adjusts the printing side-to-side registration from the 1st paper feed station using the trimming area pattern (SP2-12, No.10).	+9.0 ~ –9.0 0.1 mm/step [+3.0 mm]
			Use the ▲ or ▼ key to toggle between + and - before entering the value. The specification is 2 ± 1.5 mm.	

Menu			Function	Settings [Default]
Menu Level 2	Menu Level 3			
1	3	Side-to-Side Registration (Tray 2)	Adjusts the printing side-to-side registration from the 2nd paper feed station using the trimming area pattern (SP2-12, No. 10). Use the ▲ or ▼ key to toggle between + and – before entering the value. The specification is 2 ± 1.5 mm.	+9.0 ~ –9.0 0.1 mm/step [+3.0 mm]
	4	Side-to-Side Registration (Duplex)	Adjusts the printing side-to-side registration from the duplex tray using the trimming area pattern (SP2-12, No. 10). Use the ▲ or ▼ key to toggle between + and - before entering the value. The specification is 2 ± 1.5 mm.	+9.0 ~ –9.0 0.1 mm/step [+0.0 mm]
	5	Side-to-Side Registration (By-pass feed)	Adjusts the printing side-to-side registration from the by-pass feed table using the trimming area pattern (SP2-12, No.10). Use the ▲ or ▼ key to toggle between + and – before entering the value. The specification is 2 ± 1.5 mm.	+9.0 ~ –9.0 0.1 mm/step [+3.0 mm]
	6	Side-to-Side Registration (LCT)	Adjusts the printing side-to-side registration from the LCT using the trimming area pattern (SP2-12, No. 10). Use the ▲ or ▼ key to toggle between + and – before entering the value. The specification is 2 ± 1.5 mm.	+9.0 ~ –9.0 0.1 mm/step [+1.5 mm]
2	1	Paper Feed Timing (Paper Feed Trays)	Adjusts the relay clutch timing at registration. The relay clutch timing determines the amount of paper buckle at registration. (A +ve setting leads to more buckling.)	+9.0 ~ –9.0 1 mm/step [+0 mm]
	2	Paper Feed Timing (Duplex)		
	3	Paper Feed Timing (By-pass)		
3		Fusing Temperature Control	Selects the fusing temperature control mode.	On/Off or Phase [On/Off]
4	1	Fusing Temperature Adjustment (Paper Tray)	Adjusts the fusing temperature for paper fed from a paper tray.	170 ~ 200 1°C/step [185°C]

Service Tables

Menu			Function	Settings [Default]
Menu Level 2	Menu Level 3			
4	2	Fusing Temperature Adjustment (By-pass)	Adjusts the fusing temperature for paper fed from the by-pass feed unit.	170 ~ 200 1°C/step [185°C]
5	1	Charge Roller Bias Adjustment (Printing)	Adjusts the voltage applied to the grid plate during printing. After replacing the drum or charge roller, change this value to the default.	–1,000 ~ -2,000 10 V/step [-1620 V]
	2	Charge Roller Bias Adjustment (ID sensor pattern)	Adjusts the voltage applied to the charge roller when making the Vsdp ID sensor pattern (for charge roller voltage correction). The actual charge roller voltage is this value plus the value of SP2-5-1. Do not adjust.	0 ~ 700 10 V/step [400 V]
6	1	Laser Beam Pitch Adjustment - 400 dpi	Input the laser beam pitch value for 400-dpi resolution. After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-6-3 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.	8 ~ 260 4 pulses/step [144]
	2	Laser Beam Pitch Adjustment - 600 dpi	Input the laser beam pitch value for 600-dpi resolution. After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-6-4 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.	28 ~ 284 4 pulses/step [168]
	3	Laser Beam Pitch Initial Setting - 400 dpi	Initializes the laser beam pitch for 400 dpi to the SP2-6-1 value. Press "Enter #" to initialize. After inputting data for SP2-6-1, this SP must be performed.	Execute
	4	Laser Beam Pitch Initial Setting - 600 dpi	Initializes the laser beam pitch for 600 dpi to the SP2-6-2 value. Press "Enter #" to initialize. After inputting data for SP2-6-2, this SP must be performed.	Execute
	5	Beam Pitch Data Reset	Resets the values of current LD unit position and laser beam pitch change counter. Press "Enter #" to reset. After replacing the LD unit, this SP mode must be done.	Execute

Menu			Function	Settings [Default]
Menu Level 2	Menu Level 3			
7		Polygon Motor Off Timer	Input the time that the polygon motor turns off after entering the stand-by condition. If set at “0”, the polygon mirror motor never turns off during stand-by. However, when the machine goes into energy saver mode, the polygon mirror motor turns off regardless of this timer.	0 ~ 60 5 seconds/step [10 seconds]
8		Development Bias Adjustment (for ID sensor)	Adjusts the development bias for developing ID sensor pattern. This can be adjusted as a temporary measure if faint sheets printed appear due to an aging drum.	200 ~ 700 10 V/step [410 V]
9	1	Transfer Current Correction (By-pass feed - a)	Adjusts the transfer current correction coefficient that is used if the paper width is less than 150 mm.	1.0 ~ 3.0 0.1/step [1.5]
	2	Transfer Current Correction (By-pass feed - b)	Adjusts the transfer current correction coefficient that is used if the paper width is less than 216 mm.	1.0 ~ 3.0 0.1/step [1.5]
10		TD Sensor Initial Setting	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 4.0 V. Press “Enter #” to start. After finishing this, the TD sensor output voltage is displayed. E.g. 4.00 V Use this mode only after changing the TD sensor and developer, or adding new developer.	Execute

Menu			Function	Settings [Default]
Menu Level 2	**Menu Level 3**			
11	1	TD Sensor Manual Setting - V_{TS}	Adjusts the TD sensor output (V_T).	1.0 ~ 5.0 0.01V/step [4.00 V]
			Change this value after replacing the development unit with another one that already contains toner. For example, when using a development unit from another machine for test purposes. To adjust V_{TS}, do the following. 1. Check the value of SP2-11-1 in both the machine containing the test unit and the machine that you are going to move it to. 2. Install the test development unit, then input the V_{TS} for this unit into SP2-11-1. 3. After the test, put back the old development unit, and change SP2-11-1 back to the original value.	
	2	TD Sensor Manual Setting - V_{TMIN}	Adjusts the minimum value for SP2-11-1.	1.00 ~ 5.00 0.01V/step [3.70 V]
12	1	Test Pattern Printing	Prints the printer test patterns. See section 4.2.3 for how to print test patterns. Example: 10 Trimming area pattern	0 ~ 20 [0]
			This SP mode is useful for finding whether the LDDR or the BICU is defective. If the printout is not OK, the LDDR is defective.	
13	1	Process Control Setting - Charge-a	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray.	0 ~ 400 10 V/step [250 V]
			Use this SP when an image problem (such as white spots at the center of black dots or breaks in thin black lines) occurs when paper with a small width is fed from the by-pass feed tray	
	2	Process Control Setting - Charge-b	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray.	0 ~ 400 10 V/step [50 V]
			Use this SP when an image problem (see 2-13-1) occurs when paper with a small width is fed from the by-pass feed tray.	

Menu			Function	Settings [Default]
Menu Level 2	Menu Level 3			
13	3	Process Control Setting - By-pass-a	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. Use this SP when an image problem (see 2-13-1) occurs when paper with a small width is fed from the by-pass feed tray.	0 ~ 400 10 V/step [200 V]
	4	Process Control Setting – By-pass-b	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. Use this SP when an image problem (see 2-13-1) occurs when paper with a small width is fed from the by-pass feed tray.	0 ~ 400 10 V/step [50 V]
14		ID Sensor Initial Setting	Performs the ID sensor initial setting. The ID sensor output for the bare drum (V_{SG}) is adjusted to 4.0 ± 0.2V. Press “Enter #” to initialize. This SP mode should be performed after replacing or cleaning the ID sensor or replacing the drum or doing an NVRAM clear.	Execute
15	1	HDD Setting (Media Test)	Checks for bad sectors on the hard disk that develop during machine use. Press “Enter #” to start. This takes 4 minutes. This SP mode should be done when an abnormal image is printed. There is no need to do this at installation as the hard disk firmware already contains bad sector information, and damage is not likely during transportation. Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware.	Execute
	2	HDD Setting (Bad Sector Information Reset)	Resets the bad sector information, which is stored in the NVRAM. Press “Enter #” to reset. This SP should be performed when the hard disk is replaced.	Reset
16		A3/11" x 17" Double Count	Specifies whether the counter is doubled for A3/11"x17" paper. Press ▼ or ▲ key to select “No” or “Yes”. If "Yes" is selected, the total counter and the current user code counter count up twice when A3/11"x17" paper is used.	No or Yes [No]

Menu			Function	Settings [Default]
Menu Level 2	Menu Level 3			
17		Auto Off Mode Disabling	Selects energy saver mode off. Press ▼ or ▲ key to select “No” or “Yes”.	No or Yes [Yes]
			In the default setting, the 0th minute option of the energy saver timer range will appear on the LCD in the user menu, and the user can disable the energy saver mode. (In the user menu, the user will be able to select 0 minutes.)	
18		Memory All Clear	Resets all correction data for process control and all software counters. Also, returns all modes and adjustments to the default settings. See the "Memory All Clear" section for how to use this SP mode correctly. Press ““Enter #” twice, then turn the main power switch off and on.	
			Normally, this SP mode should not be used. It is used only after replacing the NVRAM, or when the copier malfunctions due to a damaged NVRAM.	
19	1 ~ 9	Input Check	Displays the signals received from sensors and switches. See the "Input Check" section for details.	
20		Output Check	Turns on the electrical components individually for test purposes. See the "Output Check" section for details.	1 ~ 99
21		Plug & Play Brand Name and Production Name Setting	Selects the brand name and the production name for Windows 95 Plug & Play. This information is stored in the NVRAM. If the NVRAM is defective, these names should be registered again.	
			After selecting, press the “Enter #” key. If the setting is completed, a “*” mark will be displayed before the selection.	
22	1	SMC Printing - All Data	Prints all the system parameter lists. See the "System Parameter and Data Lists" section for how to print the lists.	Execute
	2	SMC Printing - SP Mode Data	Prints the SP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	Execute

Menu			Function	Settings [Default]
Menu Level 2	Menu Level 3			
22	3	SMC Printing – Logging Data	Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists.	Execute
	4	SMC Printing - Large Font Size	Prints the SP mode data list with a large font size. See the "System Parameter and Data Lists" section for how to print the lists.	Execute
23		Punch Hole Position Adjustment (2 Punch Hole Type)	Adjusts the punch hole position in the sub-scan direction for the punch unit with two punch holes. Use ▲ or ▼ key to toggle between + and -. A larger value shifts the punch holes towards the edge of the paper.	–7.5 ~ +7.5 0.5 mm/step [0 mm]
24		Punch Hole Position Adjustment (3 Punch Hole Type)	Adjusts the punch hole position in the sub-scan direction for the punch unit with three punch holes. Use ▲ or ▼ key to toggle between + and -. A larger value shifts the punch holes towards the edge of the paper.	–7.5 ~ +7.5 0.5 mm/step [0 mm]
25	1	SC/Jam Counter Reset	Resets the SC and jam counters. Press “Enter #” to reset.	Reset
	2	Reset the total Copy Counter by Paper Tray	Resets the total copy counter by paper tray. Press “Enter #” to reset. Use these SP modes when replacing the pick-up, feed, and separation rollers in the paper feed stations	Reset
26		SC Reset	Resets the SC, press “Enter #”.	Reset
27		Timing Switch	Selects when the timing switch is on. Press ▼ or ▲ key to select “On” or “Off”. If a dirty image printing on the backside of the first sheet occurs, select “On” to prevent this problem. When selecting “On”, the print start timing changes after auto power control (see the “auto power control” section (2.2.3)) is done.	On or Off [Off]
28		User Maintenance Off	If the engineer will execute the preventive maintenance, select “No”. When “No” is selected for this menu, the machine will not display “Change Maint. Kit”.	No or Yes [No]

Service Tables

4.2.3 TEST PATTERN PRINTING (SP2-12)

NOTE: Do not operate the machine until the test pattern is printed out completely. Otherwise, an SC may occur.

1. Access the SP mode 2-12, then select a test pattern number by ▼ or ▲ key.
2. Press the “Enter #” key to store the test pattern.
3. Access the SP mode 2-22-2 (SMC Printing - SP Mode Data).
4. Press “Enter #” to print selected test pattern.
5. After finished test pattern printing, do either of the following steps to clear stored test pattern.
   –access the SP mode 2-12 and set test pattern to “0” (None), then exit the SP mode
   –turning off and on machine
6. Exit the SP mode.

Test Pattern Table (SP2-12: Test Pattern Printing - Printing)

No.	Test Pattern	No.	Teat Pattern
0	None	11	Argyle Pattern
1	Vertical Line (1-dot)	12	16 Grayscales (Horizontal)
2	Horizontal Line (1-dot)	13	16 Grayscales (Vertical)
3	Vertical Line (2 dot)	14	16 Grayscales (Vert./Hor.)
4	Horizontal Line (2-dot)	15	16 Grayscales (Vert./Hor Overlay)
5	Grid Pattern (Single-dot)	16	Not used
6	Grid Pattern (Double-dot)	17	Horizontal Line (1-dot)
7	Alternating Dot Pattern	18	Grid Pattern (Single-dot)
8	Full Dot Pattern	19	Grid Pattern (Double-dot)
9	Black Band	20	Alternating Dot Pattern
10	Trimming Area		

4.2.4 INPUT CHECK

Main Machine Input Check (SP2-19)

1. Access SP mode.
2. Select the menu level 3 SP number which will access the switch or sensor you wish to check.
3. Check the status of the sensor or switch.
   NOTE: If you wish to change to another menu 3 level, press the “Next” or “Prev.” key.
4. The reading (“0” or “1”) will be displayed. The meaning of the display is as follows.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
|	|	|	|	|	|	|	|
0	0	0	0	0	0	0	0

Class 3 no.	Bit no.	Description	Reading	
			0	1
1 (Upper Tray)	7	Not used		
	6	Height Sensor 2	Not activated	Activated
	5	Height Sensor 1	Not activated	Activated
	4	Not used		
	3	Paper Size Sensor 4	Switch pressed	Switch not pressed
	2	Paper Size Sensor 3	Switch pressed	Switch not pressed
	1	Paper Size Sensor 2	Switch pressed	Switch not pressed
	0	Paper Size Sensor 1	Switch pressed	Switch not pressed
2 (Lower Tray)	7	Not used		
	6	Height Sensor 2	Not activated	Activated
	5	Height Sensor 1	Not activated	Activated
	4	Not used		
	3	Paper Size Sensor 4	Switch pressed	Switch not pressed
	2	Paper Size Sensor 3	Switch pressed	Switch not pressed
	1	Paper Size Sensor 2	Switch pressed	Switch not pressed
	0	Paper Size Sensor 1	Switch pressed	Switch not pressed
3 (Registration & others)	7	Zero Cross Signal	Detected	Not detected
	6	Transfer Belt Unit H.P Sensor	Not at home position	At home position
	5	Exhaust Fan Lock Signal	Not locked	Locked

Class 3 no.	Bit no.	Description	Reading	
			0	1
3 (Registration & others)	4	Cooling Fan Lock Signal	Not locked	Locked
	3	Main Motor Lock Signal	Not locked	Locked
	2	Toner Overflow Sensor	Tank not full	Tank Full
	1	Cover Open	Cover closed	Cover opened
	0	Registration Sensor	Paper detected	Paper not detected
4 (By-pass)	7	Not used		
	6	Paper End Sensor	Paper detected	Paper not detected
	5	Not used		
	4	Paper Size Sensor 4	See table 1	
	3	Paper Size Sensor 3		
	2	Paper Size Sensor 2		
	1	Paper Size Sensor 1		
	0	Unit Set Signal	Connected	Not connected
5 (Bridge Unit)	7	Not used		
	6	Unit Set Signal	Connected	Not connected
	5	Paper Sensor	Paper detected	Paper not detected
	4	Relay Sensor	Paper not detected	Paper detected
	3	Exit Sensor	Paper not detected	Paper detected
	2	Left Cover Switch	Switch pressed (cover closed)	Switch not pressed
	1	Right Cover Switch	Switch pressed (cover closed)	Switch not pressed
	0	Tray Exit Unit Switch	Switch pressed (cover closed)	Switch not pressed
6 (Unit Set)	7	Not used		
	6	F gate Signal	Active	Not active
	5	Height Sensor	At feed height position	Not at feed height position
	4	Paper Exit Sensor	Paper detected	Paper not detected
	3	Fusing Unit	Detected	Not detected
	2	Total Counter	Not detected	Detected
	1	Key Counter	Detected	Not detected
	0	Not used		
7 (Paper End)	7	Not used		
	6	Right Lower Cover Switch	Switch not pressed	Switch pressed
	5	2nd Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	4	1st Tray Height Sensor	Paper not at upper limit	Paper at upper limit

Class 3 no.	Bit no.	Description	Reading	
			0	1
7 (Paper End)	3	Lower Relay Sensor	Paper detected	Paper not detected
	2	Upper Relay Sensor	Paper detected	Paper not detected
	1	Lower Paper End Sensor	Paper not detected	Paper detected
	0	Upper Paper End Sensor	Paper not detected	Paper detected
8 (I/O Board Dip Switch 101)	7	Dip Switch - 8	On	Off
	6	Dip Switch - 7	On	Off
	5	Dip Switch - 6	On	Off
	4	Dip Switch - 5	On	Off
	3	Dip Switch - 4	On	Off
	2	Dip Switch - 3	On	Off
	1	Dip Switch - 2	On	Off
	0	Dip Switch - 1	On	Off
9 (Duplex)	7	Not used		
	6			
	5			
	4			
	3	Exit Sensor	Paper detected	Paper not detected
	2	Entrance Sensor	Paper detected	Paper not detected
	1	Cover Guide Sensor	Cover guide opened	Cover guide closed
	0	Duplex Unit Switch	Switch pressed (cover closed)	Switch not pressed

4.2.5 OUTPUT CHECK

NOTE: Motors keep turning in this mode regardless of upper or lower limit sensor signals. To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

Main Machine Output Check (SP2-20)

1. Access SP mode 2-20.
2. Select the SP number that corresponds to the component you wish to check by pressing ▲ or ▼ key.
3. Press “Enter #” to check that component.
4. Press “Escape” to interrupt the test.
5. If you wish to check another component, press ▲ or ▼ key.

No.	Description
1	Upper Paper Feed Clutch
2	Lower Paper Feed Clutch
3	Upper Paper Feed Clutch (PTU)
4	Lower Paper Feed Clutch (PTU)
5	Paper Feed Clutch (By-pass)
6	Paper Feed Clutch (LCT)
7 ~ 12	Not used
13	Pick-up Solenoid (By-pass)
14	Pick-up Solenoid (LCT)
15, 16	Not used
17	Upper Transport Motor (Finishers)
18	Lower Transport Motor (3,000-sheet Finisher only)
19	Shift Tray Exit Motor (3,000-sheet Finisher), Exit Motor (1,000-sheet Finisher)
20	Staple Hammer Motor (Finishers)
21	Punch Motor (Punch Unit)
22 ~ 24	Not used
25	LCT Motor (LCT)
26	Tray Motor (PTU)
27	Not used
28	Main Motor
29	Transport Motor (Duplex)
30	Inverter Motor – Reverse (Duplex)
31	Inverter Motor - Forward (Duplex)

No.	Description
32 ~ 34	Not used
35	Relay Clutch (PTU)
36	Relay Clutch
37	Not used
38	Relay Clutch (LCT)
39	Registration Clutch
40	Not used
41	Exit Junction Gate Solenoid (Interchange Unit)
42	Duplex Junction Gate Solenoid (Interchange Unit)
43, 44	Not used
45	Inverter Gate Solenoid (Duplex)
46	Not used
47	Junction Gate Solenoid (Bridge Unit)
48, 49	Not used
50	Tray Junction Gate Solenoid (3,000-sheet Finisher only)
51	Stapler Junction Gate Solenoid (Finishers)
52	Positioning Roller Solenoid (Finishers)
53 ~ 55	Not used
56	Toner Supply Motor
57	Transfer Belt Clutch
58 ~ 61	Not used
62	Quenching Lamp
63	Charge Roller Bias
64 ~ 66	Not used

No.	Description
67	Development Bias
68	Not used
69	Transfer Belt Bias
70	ID Sensor
71 ~ 74	Not used
75	Exhaust Fan Motor
76	Cooling Fan Motor
77	Not used
78	Cooling Fan Motor (Bridge Unit)
79 ~ 84	Not used
85	Not used
86 ~ 89	Not used
90	Laser Diode

No.	Description
91	Not used
92	Shift Tray Lift Motor (Finishers)
93	Jogger Motor (3,000-sheet Finisher)/Jogger Fence Motor (1,000-sheet Finisher)
94	Stapler Motor (3,000-sheet Finisher)
95	Stack Feed Out Motor (Finishers)
96	Shift Motor (Finishers)
97	Stapler Rotation Motor (3,000-sheet Finisher)
98 ~ 99	Not used

4.2.6 SYSTEM PARAMETER AND DATA LISTS (SMC LISTS)

1. Access SP mode 2-22 and select the menu level 3 number corresponding to the list that you wish to print.
2. Press the “Enter #” key to print the list.
3. Exit SP mode.

4.2.7 MEMORY ALL CLEAR (SP2-18)

NOTE: Memory All Clear mode resets all the settings stored in the NVRAM to their default settings except the following:

- Electrical total counter value
- PM counter value
- Machine serial number
- Plug & Play Brand Name and Production Name Setting (SP2-21)

Among the settings that are reset are the correction data for process control and all the software counters.

Normally, this SP mode should not be used. This procedure is required only after replacing the NVRAM or when the copier malfunctions due to a damaged NVRAM.

1. Print out all SMC Data Lists (SP mode 2-22).
2. Access SP mode 2-18.
3. Press the "Enter #" key twice.
4. Turn the main power switch off and back on.
5. Do the laser beam pitch adjustment.

6. Do the printer registration and magnification adjustments (see Replacement and Adjustment - Copy Adjustments).
7. Referring to the SMC data lists, re-enter any values that had been changed from their factory settings.
8. Do SP2-14 (ID Sensor Initial Setting) and SP2-15-1 (HDD media test).

Check the print quality and the paper path, and do any necessary adjustments.

4.2.8 SOFTWARE RESET

When the printer hangs up, turn the main switch off and on to reset software.
NOTE: The printer has no software reset mode.

4.2.9 PRINTER RESTART AND MENU RESET (USER MENU)

The following parameters are user menu. See section 4.6 User menu.

Printer Restart
This parameter initializes the printer.

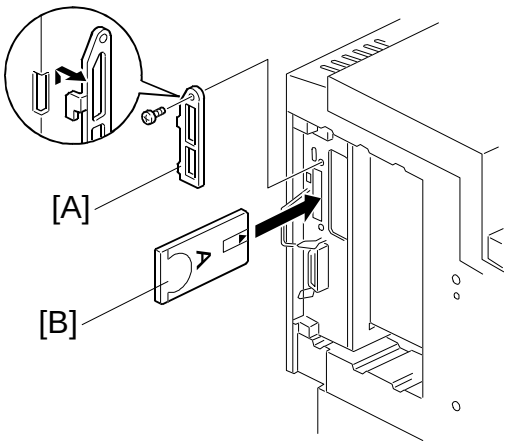
Menu Reset
This parameter resets the user menu settings to the default value.

4.3 DOWNLOADING NEW FIRMWARE

New firmware for the printer controller and PostScript can be downloaded from a PC through the parallel cable and from a flash memory card through the PCMCIA port.

4.3.1 FIRMWARE UPDATE USING A FLASH MEMORY CARD (SP1-1-2 AND 1-2-2)

1. Prepare a flash memory card that has been programmed with the latest firmware.
   NOTE: When you program a flash memory card with a firmware file, use the following parameter settings.
   - Start Address - 000000h
   - Length - 3FFFFFh
2. Turn off the machine, remove the cover [A], and insert the flash memory card [B] into the slot so that the “A” side of the card faces the front of the machine.



G035M001.WMF

3. Turn on the machine and enter the SP mode.
4. Choose “1-1-2 – Flash SYS From PCMCIA” or “1-2-2 – Flash PS From PCMCIA” depending on the firmware type.
5. Press “Enter #” in reply to the confirmation message. Firmware download will take several minutes.
6. After new firmware has been downloaded successfully, turn off the machine, remove the card from the slot, and turn the machine back on.
7. Print the “Printer Configuration Page” to check the new firmware version ([Menu] – [List Print] – [Config. Page]).
   The firmware version number is printed in the “Printer Details” section of the configuration page.

4.3.2 FIRMWARE UPDATE FROM PARALLEL PORT (SP1-1-1 AND 1-2-1)

1. Prepare the latest firmware file and Fcopy.exe on a host computer.
2. Turn off the machine, connect the host computer using a parallel cable, and turn the machine back on.
3. Enter the SP mode.
4. Choose “1-1-1 – Flash SYS from Parallel” or “1-2-1 – Flash PS From Parallel” depending on the firmware type.
5. Press “Enter #” in reply to the confirmation message.
6. On the host computer, start MS-DOS Prompt and type the following command.

   Either
   C:\> FCOPY path\filename
   or
   C:\> COPY /b path\filename port

CAUTION: Do not turn off the machine while “From Parallel Processing” is displayed on the LCD, even if FCOPY has finished in the MS-DOS Prompt.

7. After new firmware has been downloaded successfully, turn off the machine, disconnect the printer cable if necessary, and turn the machine back on.
8. Print the “Printer Configuration Page” to check the new firmware version ([Menu] – [List Print] – [Config. Page]).
   The firmware version number is printed in the “Printer Details” section of the configuration page.

4.3.3 FORMATING THE HARD DISK (SP1-4)

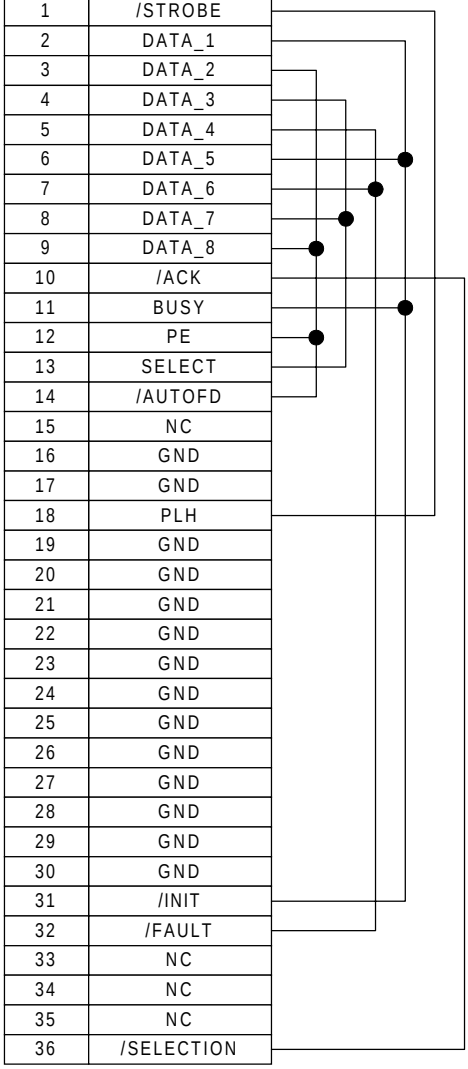
This function is used to format the printer hard disk. If the hard disk is formatted, the stored data (downloaded fonts and macros) will be erased. So, when performing this function, ask the customer for consent. After this operation, advise the customer to restore their data, if necessary.

1. Enter the SP mode.
2. Choose “1-4 – Format Disk”.
3. Press “Enter #” in reply to the confirmation message. Hard disk formatting will take several minutes.
4. After confirming that formatting was successful, turn the machine off and back on again.

4.3.4 PARALLEL LOOP BACK TEST (SP1-9)

1. Plug the loop back connector into the parallel port of the printer.
2. Enter the printer SP mode then select "1-9 – Loop Back".
3. Press "Yes" in reply to the confirmation message. The result of the test will be displayed on the operation panel.

Pin No.	Signal Name
1	/STROBE
2	DATA_1
3	DATA_2
4	DATA_3
5	DATA_4
6	DATA_5
7	DATA_6
8	DATA_7
9	DATA_8
10	/ACK
11	BUSY
12	PE
13	SELECT
14	/AUTOFD
15	NC
16	GND
17	GND
18	PLH
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND
26	GND
27	GND
28	GND
29	GND
30	GND
31	/INIT
32	/FAULT
33	NC
34	NC
35	NC
36	/SELECTION



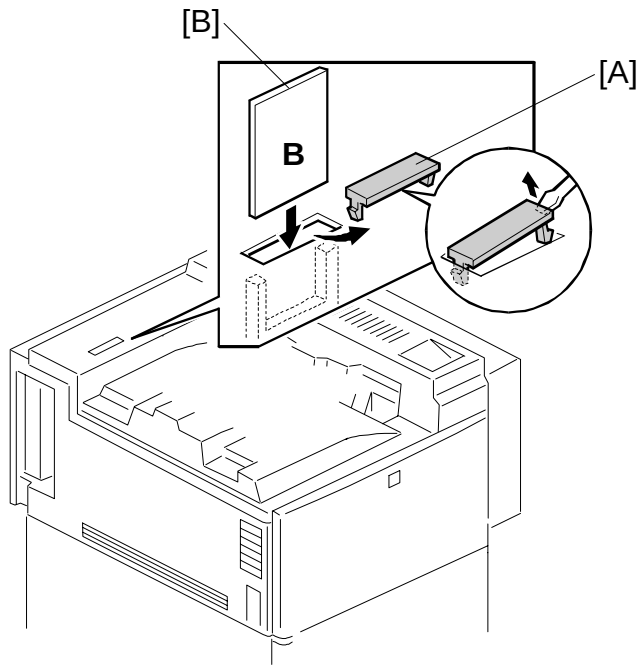
G035M003.WMF

4.4 DOWNLOADING NEW SOFTWARE

In this machine, the BICU software is upgraded using a flash memory card.

The program is downloaded from the flash memory card to the BICU.

NOTE: The procedure for how to write the source software data from a flash memory card writer to a flash memory card is described in the SwapBox FTL manual.



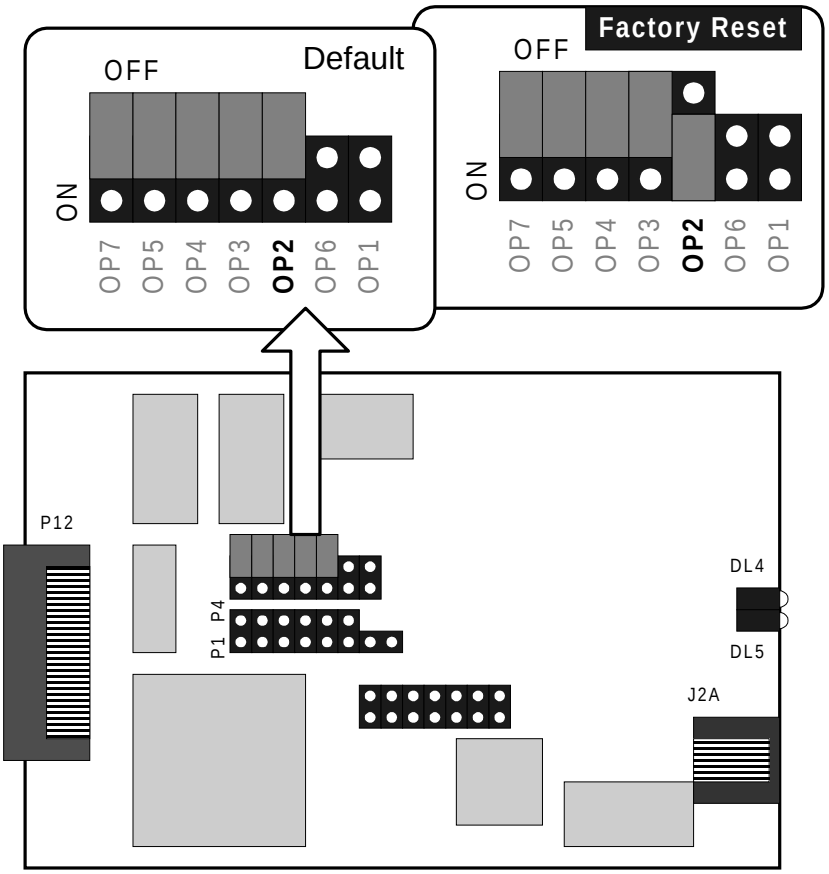
G035M919.WMF

1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “B” faces the front of the machine.
4. Turn on the main power switch.
   NOTE: 1) The machine does not display any message during the download procedure.
   2) This procedure takes about 3 minutes.
5. After 3 minutes pass, turn off the machine, remove the card from the slot, and turn the machine back on.

4.5 NETWORK INTERFACE BOARD

4.5.1 FACTORY RESET (NVRAM CLEAR)

When the machine or the network interface board has moved to a different location, reset the NVRAM contents to the factory default as follows.



G035M004.WMF

1. Remove the network interface board and change the OP2 jumper setting as shown above.
2. Install the network interface board and turn on the machine.
3. The green LED flashes 3 times, then the amber and green LEDs light alternately (once per second).
4. Turn off the machine and remove the network interface board.
5. Reset the OP2 jumper setting to the default, and put the board back in the machine.
6. Turn on the machine.

4.5.2 FLASH ROM UPDATE

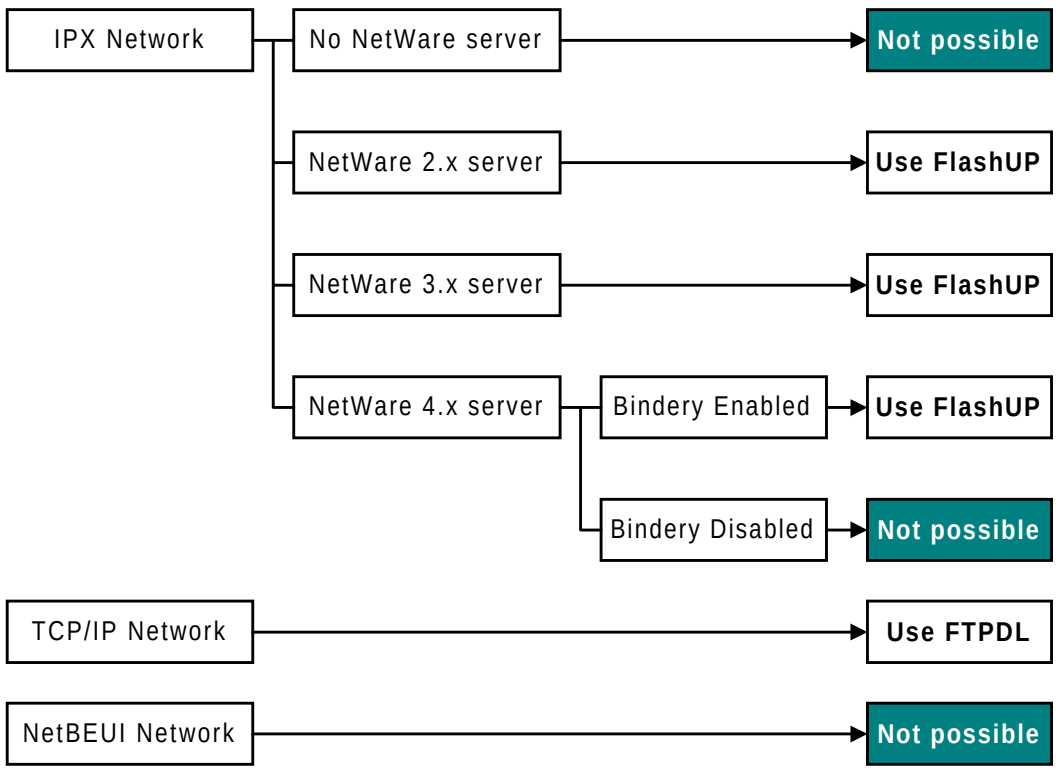
Introduction

Before you update network interface card firmware, you need to receive the latest firmware file and set up an update utility that is suitable for the network environment.

A firmware file (*.upd, *.upp, *.upt, or *.upu file) is normally distributed as a ZIP file (e.g., RIC221.ZIP). You need to unzip the file to a temporary directory on a host computer, before starting the firmware update utility.

Two types of utility software, FlashUP and FTPDL, are provided as ZIP files with this document. Use the FlashUP utility for Novell server based IPX networks, or use the FTPDL utility for TCP/IP networks. You do not need to install both because they have the same function.

NOTE: The NIB must be configured with an IP address and subnet mask, before using FTPDL utility.



G035M005.WMF

Flashup Utility (for Novell IPX Networks)

System Requirements

- Windows 3.1x/95/98, Windows NT3.5x/4.0
- Novell compatible IPX protocol installed
- Novell compatible NetWare client software installed

Network Requirements

- NetWare 2.x/3.x/4.x server running in Bindery mode

Installation Procedure

1. Unzip Flashup.ZIP to a temporary folder (directory). The following files should be extracted there.

FLASHUP.ZIP

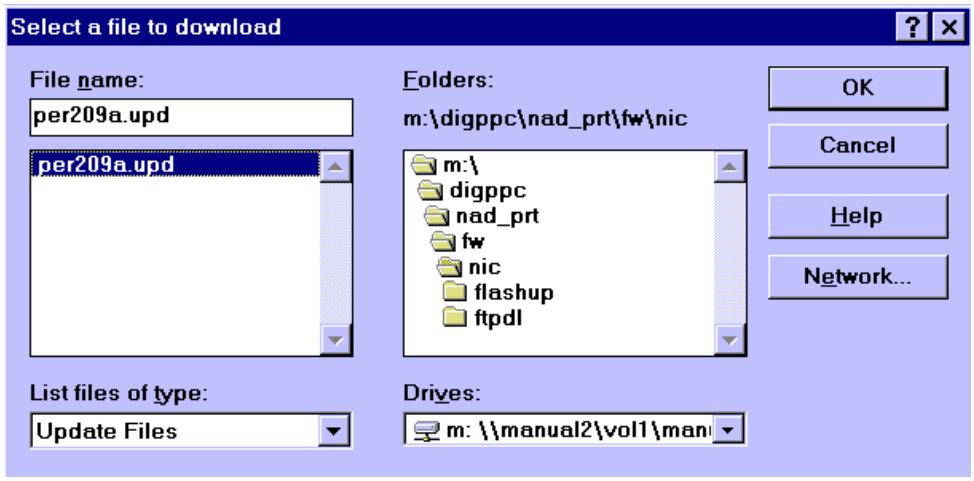
inst16.ex	274KB	EX_File	7/10/96 2:15 AM
_isdel	8KB	Application	9/7/95 8:22 PM
_setup.1	233KB	1 File	11/10/98 1:46 PM
_setup.dll	6KB	Application Extension	4/29/96 8:25 AM
_setup.lib	153KB	LIB File	11/10/98 1:45 PM
Disk1.id	1KB	ID File	11/10/98 1:46 PM
Readme	1KB	Text Document	11/6/98 8:54 AM
Setup	44KB	Application	7/24/96 4:00 AM
Setup	1KB	Configuration Settings	7/31/96 12:50 PM
Setup	64KB	Internet Communication	7/31/96 12:50 PM
Setup.iss	1KB	ISS File	11/10/98 1:45 PM
Setup.pkg	1KB	PKG File	11/10/98 1:45 PM

1. Run “Setup.exe” from the folder (directory).
2. Click “Next >” in the “Welcome” dialog box.
3. Read the readme.txt file displayed in the “Readme Information” dialog box, then click “Next >”.
4. In the “Destination Location” dialog box, choose a folder (directory) to install the software, then click “Next >”.
5. Confirm the program folder (group) name, then click “Next >”.
6. After the software has been installed, click “Finish” in the “Setup Complete” dialog box.

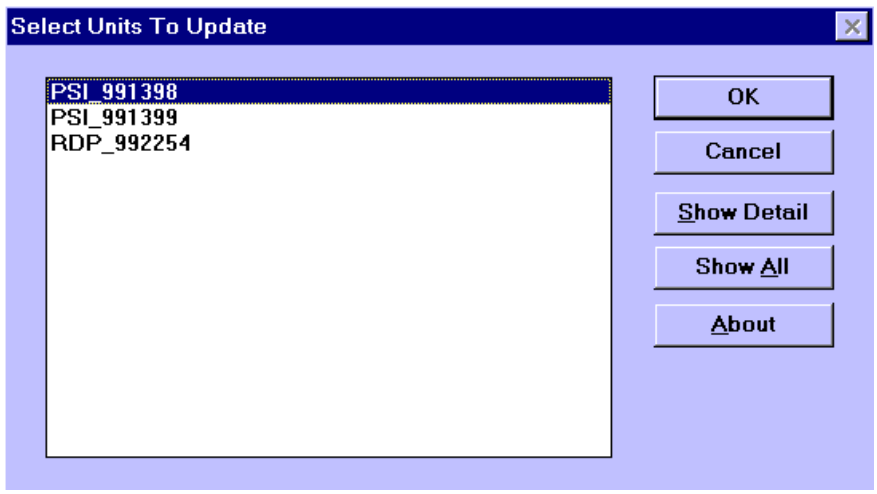
Firmware Update Procedure

1. Login to the NetWare network as “supervisor” or a user with supervisor privileges.
2. Start the FlashUP utility.

3. Choose a new firmware file and click “OK”.

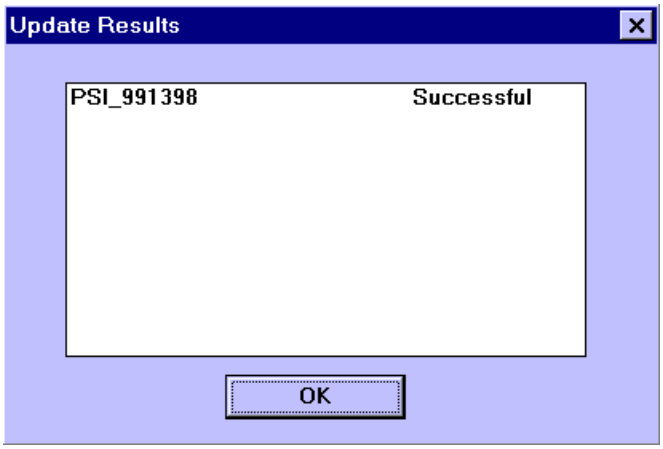


4. Choose a network interface card (or multiple cards) from the unit names listed in the dialog box, then click “OK”. Update will start.



5. If you do not see the desired unit in the list, click “Show All” to display all network interface cards that are currently logging in to the server.
   If you still cannot see the unit, click “Cancel”, restart the machine (printer), and try again.

6. After the firmware has been downloaded successfully, the following message pops up. Then click “OK” to finish.



7. The Print Server Card then updates its flash ROM. The machine will print a status report after flash ROM update has finished.

CAUTION: Do not turn off the machine until after it prints a status sheet (after automatic re-initialization). Otherwise, new firmware may not be programmed to the flash ROM successfully.

Recovery from Failed Download

Even if firmware download has failed, firmware download is still possible.

The NIB in “down” status appears as DWN_xxx_xxxxxx in the dialog box in step 4 above. Download the firmware again to the NIB in “down” status using FlashUp utility.

FTPDL Utility (for TCP/IP Networks)

System Requirements

- Windows 3.1x/95/98, Windows NT~~3.5x~~/4.0
- TCP/IP protocol installed

Network Requirements

- The target network interface board (NIB) must have a valid IP address.

NOTE: If NIB is in the “DOWN” status, this utility cannot be used because no IP address is assigned to the NIB. Use the “Flashup” utility instead.

Installation

1. Unzip ftpdl.ZIP to a temporary folder (directory). The following files should be extracted there.

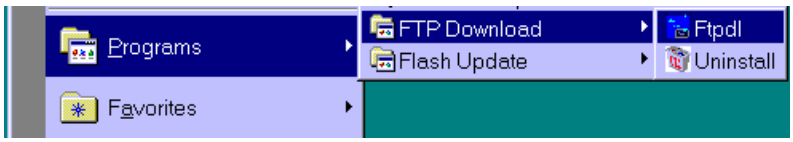
FTPDL.ZIP

_inst16.ex	274KB	EX_File	7/10/96 2:15 AM
_isdel	8KB	Application	9/7/95 8:22 PM
_Setup.1	783KB	1 File	6/11/99 4:19 PM
_Setup.dll	6KB	Application Extension	4/29/96 8:25 AM
_Setup.lib	153KB	LIB File	6/11/99 4:19 PM
Disk1.id	1KB	ID File	6/11/99 4:19 PM
Readme	2KB	Text Document	6/11/99 4:05 PM
Setup	44KB	Application	7/24/96 4:00 AM
Setup	1KB	Configuration Settings	6/11/99 4:19 PM
Setup	64KB	Internet Communication	7/31/96 12:50 PM
Setup.iss	1KB	ISS File	6/11/99 4:18 PM
Setup.pkg	1KB	PKG File	6/11/99 4:19 PM

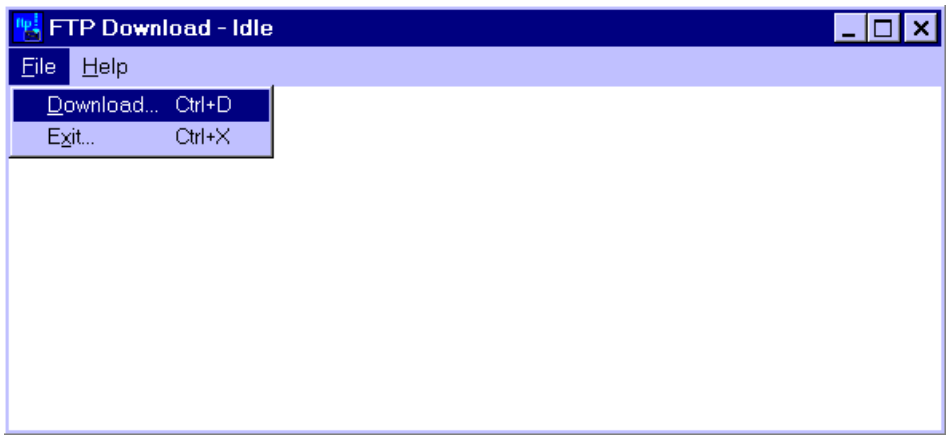
1. Run “Setup.exe” from the folder (directory).
2. Click “Next >” in the “Welcome” dialog box.
3. Read the readme.txt file displayed in the “Readme Information” dialog box, then click “Next >”.
4. In the “Destination Location” dialog box, choose a folder (directory) to install the software, then click “Next >”.
5. Confirm the program folder (group) name, then click “Next >”.
6. After the software has been installed, click “Finish” in the “Setup Complete” dialog box.

Firmware Update Procedure

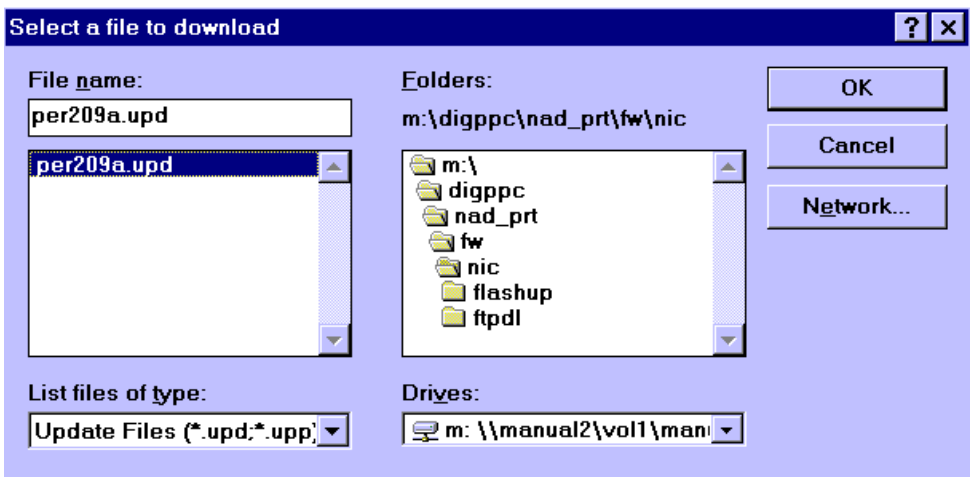
1. Start the FTPDL utility.



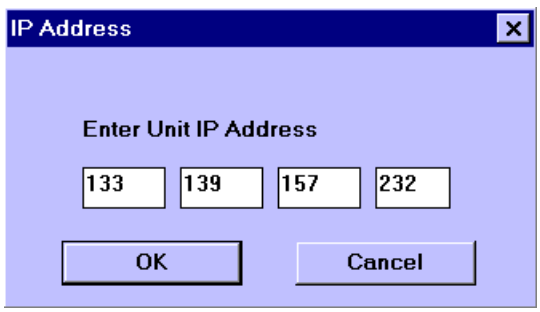
2. Choose [FIle] - [Download].



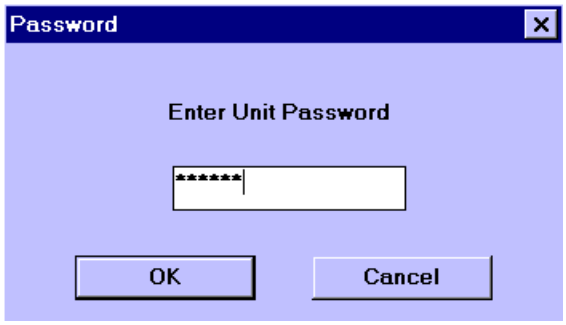
3. Choose a new firmware file and click “OK”.



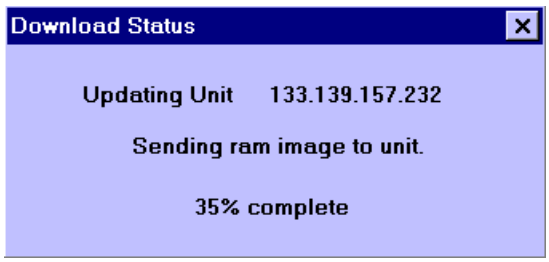
4. Enter the IP address of the network interface card in which you wish to update firmware, then click “OK”.



5. Enter the password programmed in the network interface card (“sysadm” is the default), then click “OK”.



6. After sending the flash ROM image file to the network interface card, the card updates its firmware.



7. After the firmware has been downloaded, click “OK” to finish.

8. The Print Server Card then updates its flash ROM. The machine will print a status report after the flash ROM update has finished.

CAUTION: Do not turn off the machine until after it prints a status sheet.

Recovery from Failed Download

If firmware download using FTPDL has failed, use the FlashUP utility to recover the NIB. This is because the NIB may not have IP parameters anymore after failed download.

4.6 USER MENU

The user program menu is accessed by users and operators, and by sales and service staff. The user menu is used to input the printer's default settings.

4.6.1 HOW TO ENTER AND EXIT USER MENU

Press the "Menu" key, then select the user menu. After finishing with the user menu, press the "Escape" key to exit.

4.6.2 USER MENU TABLE

NOTE: The function of each user menu is explained in the Using the Operation Panel section of the operating instructions.

System Setting Table

Category	Function Menu	
Proof Print	Print File	
	Delete File	
	Show Error Log	
Job Control	Paper Input	Page Size
		Tray Priority
		Paper Size
		Tray Paper Type
		Bypass Paper Type
		Auto Tray SW
	Paper Output	Output Tray
		Duplex
		Sort
		Staple
		Punch
	Print Quality	Edge Smoothing
		Resolution
		Image Density
		Toner Saving
	System	Copies
		Print PS Errors
		Energy Saver
		Auto Continue
	PCL Menu	Orientation
		Form Lines
		Font Source
		Font Number
		Point Size

Category	Function Menu	
Job Control	PCL Menu	Font Pitch
		Symbol Set
Host Interface	Printer Lang.	
	Parallel Setup	I/O Timeout
		Bi-direction
	Network Setup	I/O Timeout
		IP Address
		Subnet Mask
		Gateway Address
Maintenance	Printer Restart	
	Menu Reset	
	Registration	Tray3 Width
		Tray4 Width
List Print	Config. Page	
	Menu List	
	PCL Font List	
	PS Font List	
	PCL Demo Page	
	PS Demo Page	
Language		

4.7 TEST POINTS/DIP SWITCHES/LEDS

4.7.1 DIP SWITCHES

Controller Board: SW2

No.	Function	On	OFF
1	Destination for firmware downloading	**To flash ROM**	To ROM SIMM
2	Source for firmware downloading	(No.2, 3) **On, On: From Host PC** On, Off: From flash memory card Off, On: From ROM SIMM Off, Off: From flash ROM	
3			
4	Operation mode	**Normal operation**	Programming firmware

NOTE: The functions of DIP switches no.1, 2, and 3 are enabled when changing the setting of no.4 to the off position. However, **do not change the default settings** (keep them all on). Always do the firmware downloading using SP mode.

I/O Board: DIP SW101

No.	Function	ON	OFF
1	Print Speed		45 cpm (230 mm/s)
2	Jam Detection (see Note 1)	Off	On
3	SC Generation	Disabled	Enabled
4	Not used	Keep at “OFF”	
5	Not used	Keep at “OFF”	
6 7	Destination	Off) Japan On) N. America Off) Europe On) Not used Off Off On On	
8	Not used	Keep at “OFF”	

NOTE: 1) Disabling the jam detection is effective only for the main machine (not for the options).

4.7.2 JUMPER PINS

TB1: Controller Board

Function	CS0	CS1
Bank setting for resident flash ROM	**Bank setting for flash ROM is "0".**	Bank setting for flash ROM is "1".

TB2: Controller Board

Function	UN-PROT	PROT
Not used	Do not change this setting. Keep at "UN-PROT".	

4.7.3 TEST POINTS

I/O Board

Number	Monitored Signal
TP103	Ground
TP104	+24V
TP136	+5V
TP154	Ground
TP156	+12 V
TP158	–12 V
TP159	+5VE

BICU

Number	Monitored Signal
TP105	GND
TP125	F-gate signal

4.7.4 LEDS

Controller Board

Symbol	Function
PWR	This LED turns on when +5 V is supplied to the printer controller.
LED2	Refer to section 7.1.3 (LEDs) for more detail.
LED3	
LED4	
LED5	

BICU

Number	Monitored Signal
LED101	Monitors whether the program is working normally or not. The LED blinks in normal conditions.
LED102	Monitors +5VE. During the energy saver mode, this LED will blink.

4.8 SPECIAL TOOLS AND LUBRICANTS

4.8.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2309003	Adjustment Cam – Laser Unit	1
A2309004	Positioning Pin – Laser Unit	1
A2309352	Flash Memory Card – 4MB	1
A2309351	Case – Flash Memory Card	1
A0299387	Digital Multimeter – FLUKE 87	1

4.8.2 LUBRICANTS

Part Number	Description	Q'ty
A0289300	Grease Barrierta JFE 5 5/2	1
52039501	Silicone Grease G-501	1

5. PREVENTIVE MAINTENANCE SCHEDULE

5.1 PM TABLE

NOTE: The amounts mentioned as the PM interval indicate the number of prints.

Symbol key: C: Clean R: Replace L: Lubricate I: Inspect

	EM	150k	300k	450k	NOTE
AROUND THE DRUM					
Charge Roller		R	R	R	
Charge Roller Cleaning Pad		R	R	R	
Quenching Lamp			C		Dry cloth
Pick-off Pawls		R	R	R	
Spur		C	C	C	Dry cloth or alcohol
ID Sensor		C	C	C	Perform the ID sensor initial setting (SP2-14) after cleaning (blower brush)
CLEANING UNIT					
Drum Cleaning Blade		R	R	R	
Cleaning Entrance Seal		C	C	C	Blower brush. Replace if necessary.
Side Seal		I	I	I	
DEVELOPMENT UNIT					
Development Drive Gears		I	I	I	Replace every 5 PM (750k)
Development Filter			R		
Developer		I	R	I	
Entrance Seal		I	I	I	
Side Seal		I	I	I	
PAPER FEED					
Registration Roller	C	C	C	C	Clean with water or alcohol.
Paper Feed Roller	I	R	R	R	Check the counter value for each paper tray station using the SMC - Logging Data list (SP2-22-3). If the value has reached 150k, replace the roller. After replacing the roller, reset the counter (SP2-25-2).
Separation Roller	I	R	R	R	
Pick-up Roller	I	R	R	R	
Paper Feed Roller (By-pass feed table)	I	R	R	R	
Separation Roller (By-pass feed table)	I	R	R	R	
Pick-up Roller (By-pass feed table)	I	R	R	R	
Paper Feed Guides		C	C	C	Clean with water or alcohol.
Relay Rollers		C	C	C	Clean with water or alcohol.
Bottom Plate Pad		C	C	C	Clean with water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Clean with water or alcohol.
Registration Sensor		C	C	C	Blower brush

	EM	150k	300k	450k	NOTE
TRANSFER BELT UNIT					
Transfer Belt	C	R	R	R	Dry cloth
Transfer Belt Cleaning Blade		R	R	R	
Transfer Belt Rollers		C	C	C	Dry cloth
Entrance Seal		C	C	C	Dry cloth
Transfer Entrance Guide	C	C	C	C	Dry cloth
Used Toner Tank	I	C	C	C	Empty the tank.
FUSING UNIT AND PAPER EXIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Clean with water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistor		I	I	I	Clean if necessary (suitable solvent)
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		L	L	L	Grease Barrierta JFE 55/2
Pressure Roller Strippers		C	C	C	Clean with water or alcohol.
Hot Roller Strippers		C	R	C	Clean with water or alcohol.
Paper Exit Guide Ribs		C	C	C	Clean with water or alcohol.
DUPLEX UNIT					
Inverter Roller		C	C	C	Clean with water or alcohol
Upper Transport Roller		C	C	C	Clean with water or alcohol
Lower Transport Roller		C	C	C	Clean with water or alcohol
OTHERS					
Drive Belts			I		Replace if necessary

	EM	150k	300k	450k	NOTE
PAPER TRAY UNIT					
Paper Feed Rollers		R	R	R	Check the counter value for each paper tray station using the SMC – Logging Data list (SP2-22-3). If the value has reached 150k, replace the roller. After replacing the roller, reset the counter (SP2-25-2).
Pick-up Rollers		R	R	R	
Separation Rollers		R	R	R	
Relay Rollers		C	C	C	Dry or damp cloth
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150k	300k	450k	NOTE
LCT					
Paper Feed Roller		R	R	R	Check the counter value for each paper tray station using the SMC – Logging Data list (SP2-22-3). If the value has reached 150k, replace the roller. After replacing the roller, reset the counter (SP2-25-2).
Pick-up Roller		R	R	R	
Separation Roller		R	R	R	
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150k	300k	450k	NOTE
1,000-SHEET/3,000-SHEET FINISHERS					
Rollers	C				Clean with water or alcohol.
Brush Roller	I	I	I	I	Replace if necessary.
Discharge Brush	C	C	C	C	Clean with a dry cloth
Sensors	C				Blower brush
Jogger Fences	I	I	I	I	Replace if necessary.
Punch Waste Hopper	I	I	I	I	Empty the hopper.

6. REPLACEMENT AND ADJUSTMENT

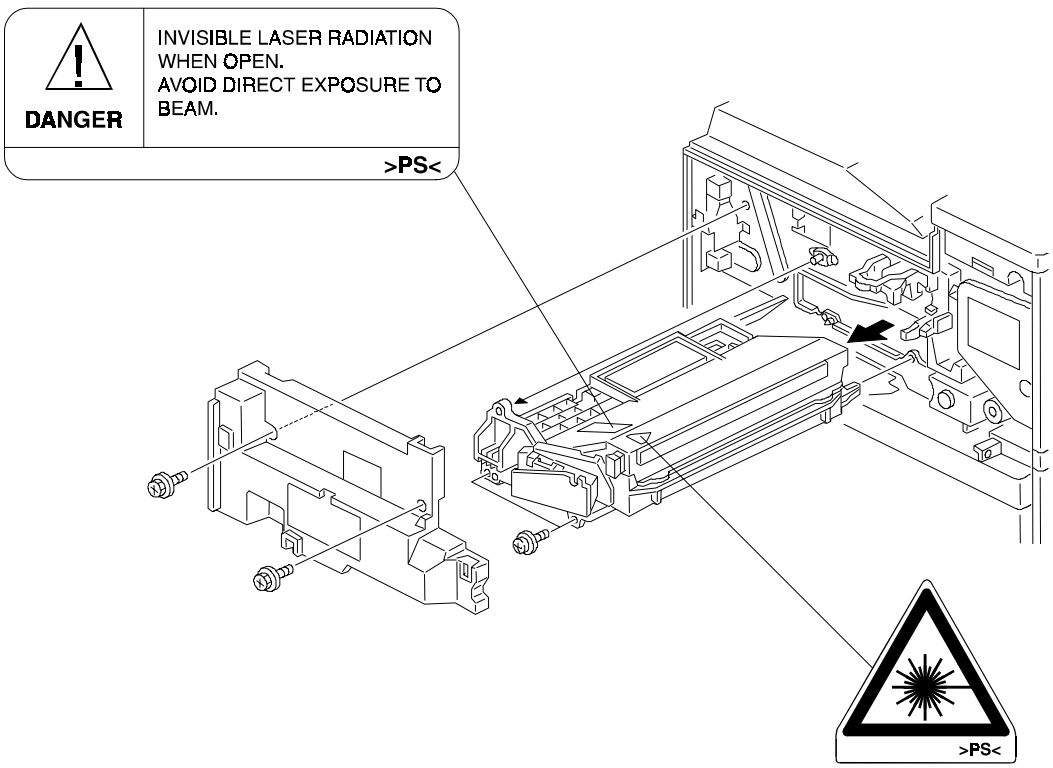
⚠CAUTION
Turn off the main power switch and unplug the machine before attempting any of the procedures in this section.

6.1 LASER UNIT

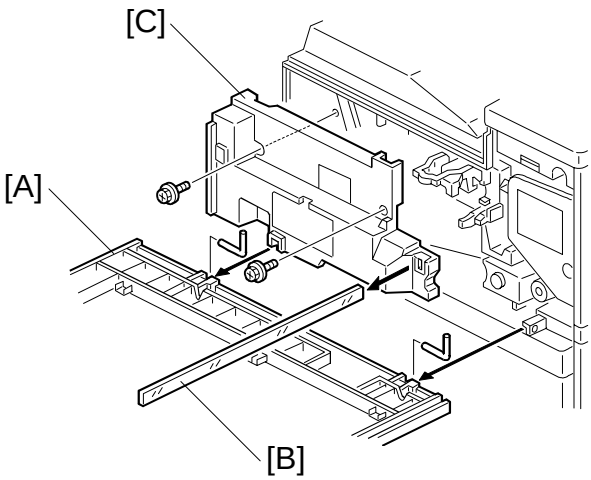
⚠WARNING
Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

6.1.1 CAUTION DECAL LOCATIONS

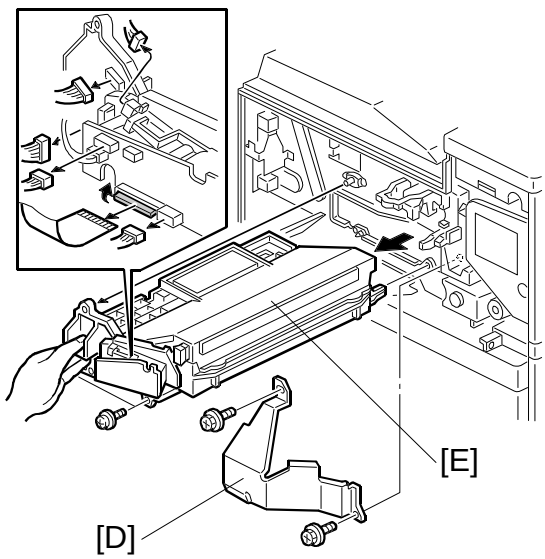
Two caution decals are located in the laser section as shown below.



6.1.2 LASER UNIT



G035R201.WMF



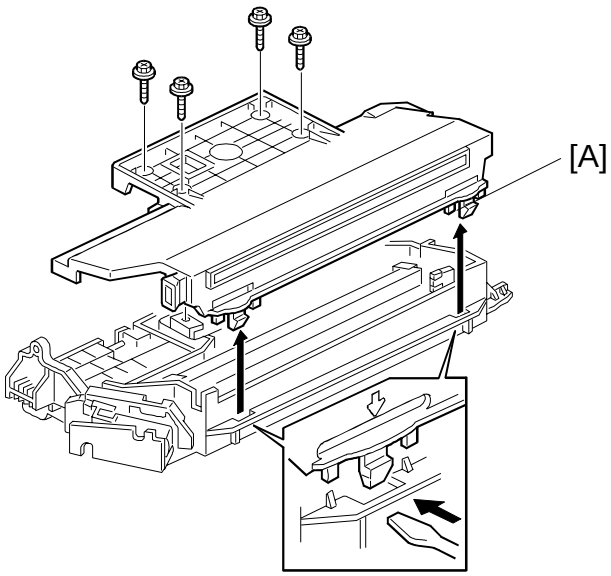
G035R540.WMF

⚠WARNING

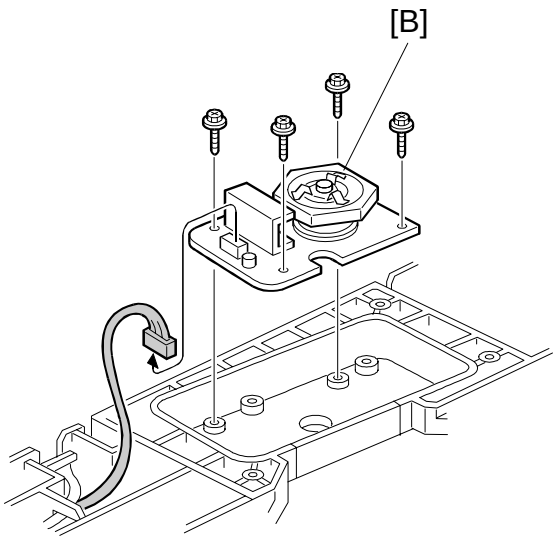
Turn off the main power switch and unplug the machine before attempting this procedure. Laser beams can seriously damage your eyes.

1. Remove the front cover [A] (2 pins).
2. Remove the shield glass [B].
3. Remove the inner cover [C] (2 screws).
4. Remove the shield plate [D] (1 screw).
5. Remove the laser unit [E] (2 screws, 5 connectors, 1 flexible harness).
   NOTE: 1) When disconnecting the harnesses from the LD unit, hold on to the LD unit.
   2) When sliding out the laser unit, do not hold the LD unit.

6.1.3 POLYGON MIRROR MOTOR



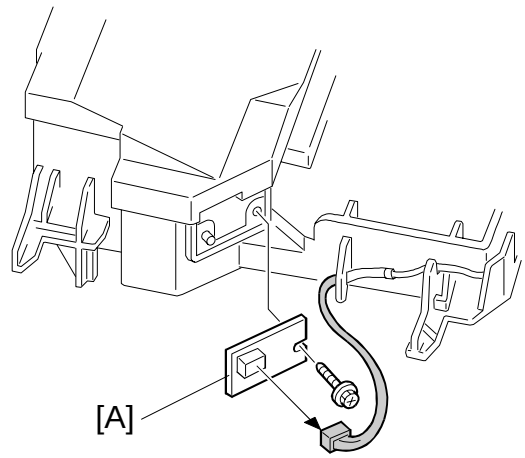
G035R203.WMF



G035R204.WMF

1. Remove the laser unit (see Laser Unit).
2. Remove the laser unit cover [A] (4 screw, 2 pawls).
3. Remove the polygon mirror motor [B] (4 screws, 1 connector).

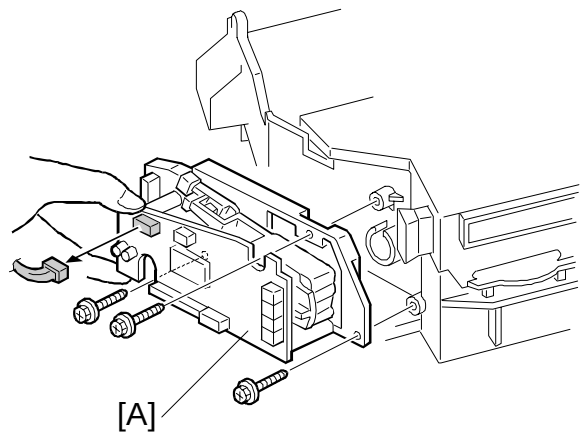
6.1.4 LASER SYNCHRONIZATION DETECTOR



G035R206.WMF

1. Remove the laser unit (See Laser Unit).
2. Remove the laser synchronization detector [A] (1 screw, 1 connector).

6.1.5 LD UNIT



G035R205.WMF

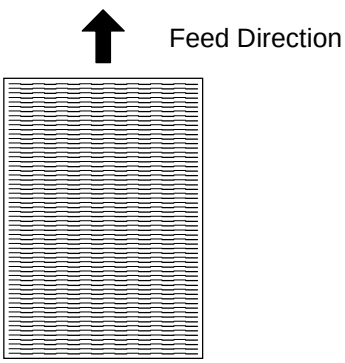
1. Remove the laser unit (See Laser Unit).
2. Remove the LD unit [A] (3 screws, 1 connector)
   NOTE: When disconnecting the harness, hold on to the LD unit.
3. After replacing the LD unit, perform SP 2-6-5, then the laser beam pitch adjustment (see the following procedure).

Laser beam pitch adjustment

There are two laser beam pitch adjustment procedures: one for 400 dpi, and one for 600 dpi. These adjustments use the following SP modes.

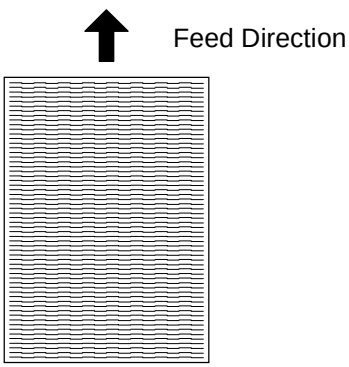
- SP2-6-1: LD Beam Pitch Adjustment – 400 dpi
- SP2-6-2: LD Beam Pitch Adjustment – 600 dpi
- SP2-6-3: LD Initial Setting – 400 dpi
- SP2-6-4: LD Initial Setting – 600 dpi
- SP2-12-1, no.12: IPU Test Pattern – Cross Stitch – 400 dpi
- SP2-12-1, no.13: IPU Test Pattern – Cross Stitch – 600 dpi

1. Do SP 2-6-5.
2. Input the value “144” into SP2-6-1.
3. Perform SP2-6-3.
4. Print the 400-dpi test pattern onto A3 (11" x 17 ") paper using SP2-12-1 no.12. (See Service Tables - Test Pattern Printing).
5. Write the value of SP2-6-1 on the test pattern (in this case “144”).
6. Change the value of SP2-6-1 and print another test pattern, repeating steps 2 to 4. Print about 5 patterns with different values for SP2-6-1 (e.g. “48”, “96”, “192”, “240”).
7. Check these test patterns. If the laser beam pitch is not correct, the image looks like a black vertical strip pattern.
   NOTE: As an example, if the pattern made with the value “192” has less obvious strips than the other print outs, the correct value is near “192”.
8. Adjust the laser beam pitch position until the thin lines are of uniform thickness (no striping effect should appear on the printout), doing steps 2, 3, and 4. In step 2, input a correctly estimated value, then do steps 3 and 4. Then, if necessary, go back to step 2 and try another value.
9. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi). When starting the adjustment for 600 dpi, input a value for SP2-6-1 between 24 and 48 that is higher than the final result for 400 dpi.



G035R512.WMF

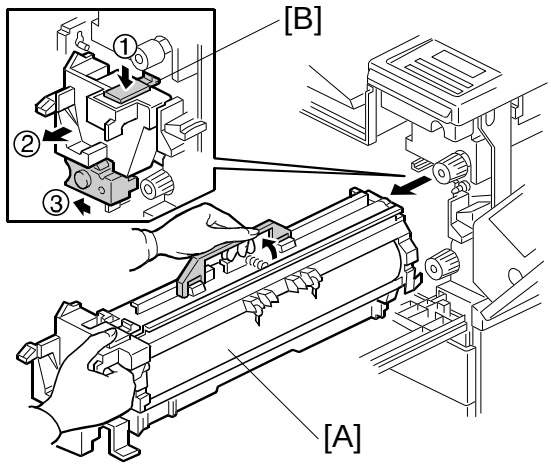
Adjustment not complete



G035R513.WMF

Adjustment complete

6.2 PHOTOCONDUCTOR UNIT (PCU) AND DEVELOPMENT UNIT

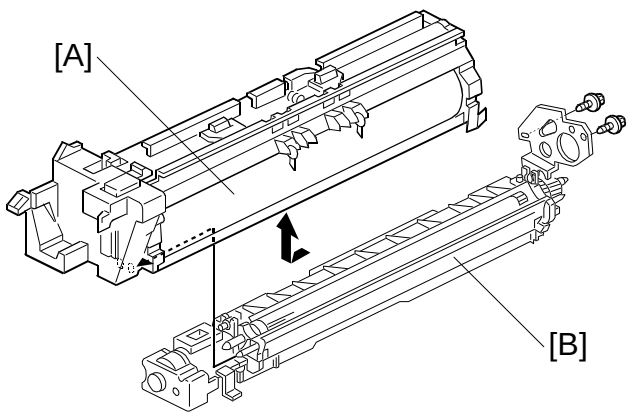


G035R554.WMF

1. Open the right cover and front cover.
2. Pull the PCU and development unit [A] out slightly while pushing the release lever [B].

6.3 PHOTOCONDUCTOR UNIT (PCU)

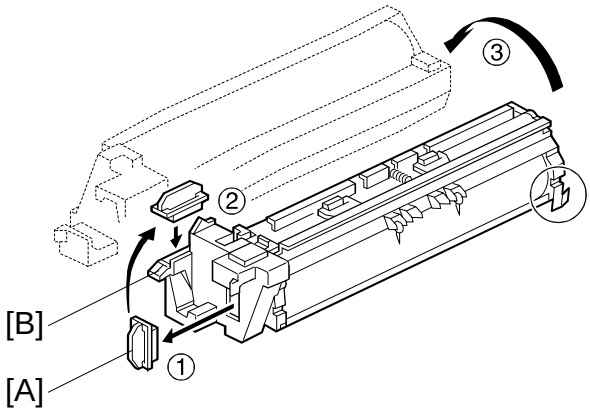
6.3.1 PCU



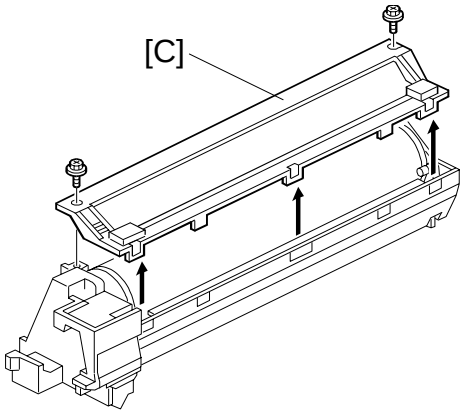
G035R552.WMF

1. Pull out the PCU and development unit. (See Photoconductor Unit and Development Unit.)
2. Remove the PCU [A] (2 screws) from the development unit [B].

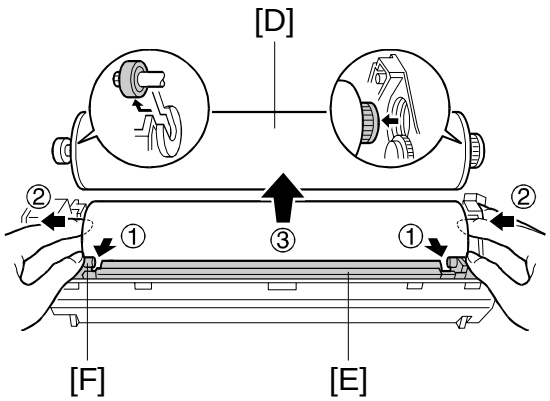
6.3.2 DRUM



G035R302.WMF



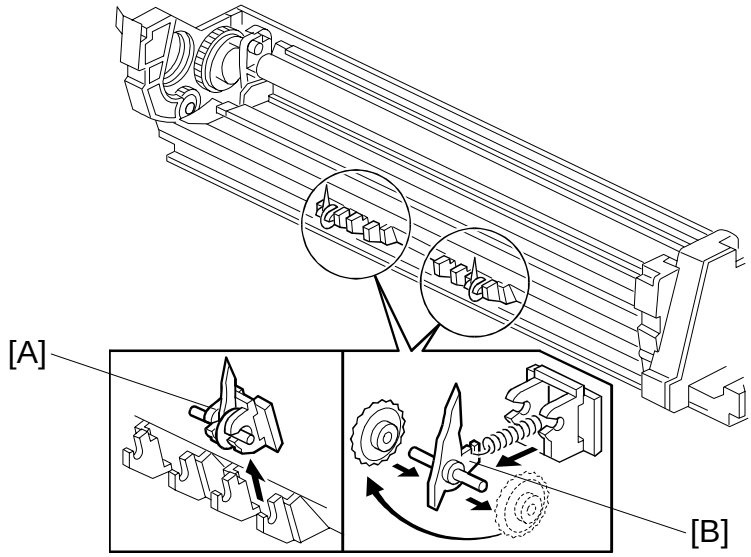
G035R303.WMF



G035R304.WMF

1. Remove the PCU. (See PCU.)
2. Remove the toner cap [A] and put it over the toner entrance hole [B].
3. Turn the PCU upside-down. Then, remove the lower PCU cover [C] (2 screws, 3 pawls).
4. Push the drum [D] towards the front ② (the left side in the illustration), while releasing the charge roller [E] using the release lever ① [F]. Then, remove the drum ③.
   NOTE: Do not touch the drum surface with bare hands.
5. After replacing the charge roller, check the value of SP2-5-1. If it is not at the standard value, change it to the standard value using SP2-5-1.
   NOTE: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.
6. After replacing the drum, perform the ID sensor initial setting using SP2-14.

6.3.3 PICK-OFF PAWLS



G035R305.WMF

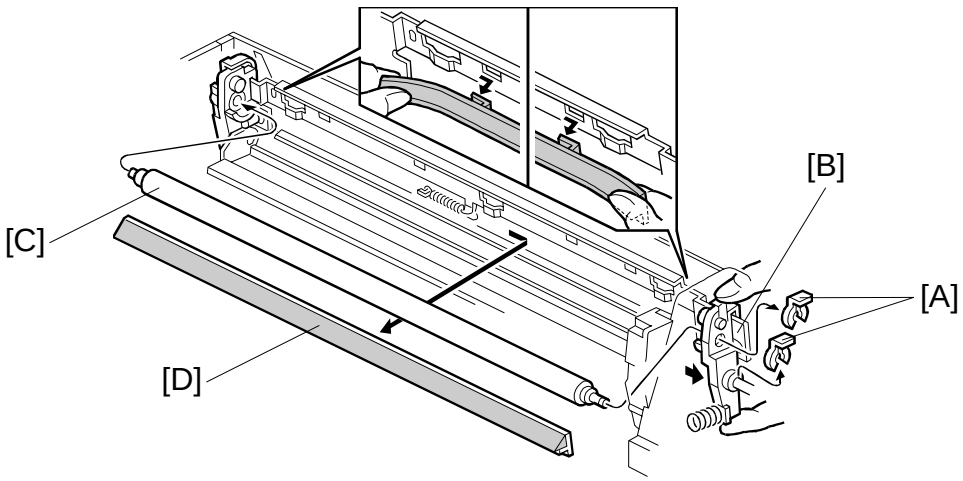
1. Remove the drum. (See Drum.)
2. Remove the pick-off pawl assembly [A].
3. Remove the pick-off pawl [B] (1 spring, 1 spur).

Pick-off Pawl Position Adjustment

If a line has appeared on the drum surface because of the pick-off pawl, the pick-off pawl position can be adjusted using either or both of the following:

- Changing the spur position.
- Changing the pick-off pawl assembly position

6.3.4 CHARGE ROLLER/CHARGE ROLLER CLEANING PAD

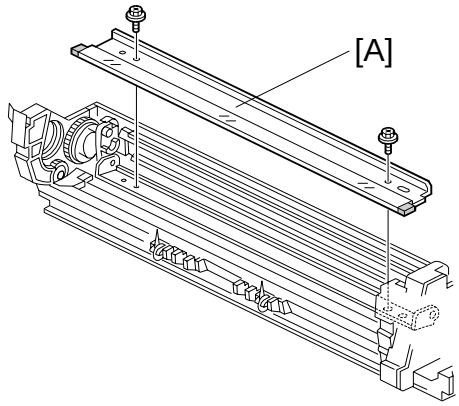


G035R306.WMF

1. Remove the drum. (See Drum.)
2. Remove two snap rings [A] and slide out the front charge roller holder [B].
3. Remove the charge roller [C].
   NOTE: Do not touch the charge roller with bare hands.
4. Remove the charge roller cleaning pad [D] (4 hooks).
5. After replacing the charge roller, check the value of SP2-5-1. If it is not at the standard value, change it to the standard value using SP2-5-1.
   NOTE: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.

   Standard value: -1620V

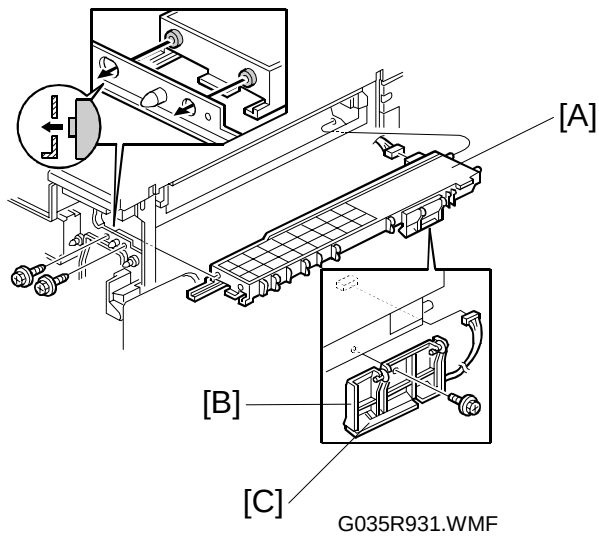
6.3.5 DRUM CLEANING BLADE



G035R307.WMF

1. Remove the drum. (See Drum.)
2. Remove the charge roller. (See Charge Roller.)
3. Remove the drum cleaning blade [A] (2 screws).

6.3.6 ID SENSOR

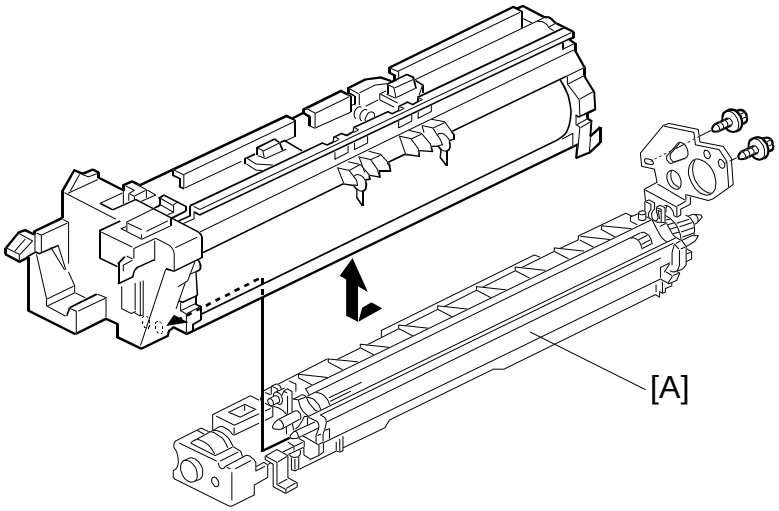


G035R931.WMF

1. Remove the PCU and development unit. (See Photoconductor Unit and Development Unit.)
2. Remove the fusing unit. (See Fusing Unit.)
3. Remove the PCU rail [A] (2 screws, 1 connector).
4. Remove the ID sensor bracket [B] (1 screw, 1 connector).
5. Remove the ID sensor [C] (1 screw).
6. Perform the ID sensor initial setting using SP2-14.

6.4 DEVELOPMENT

6.4.1 DEVELOPMENT UNIT



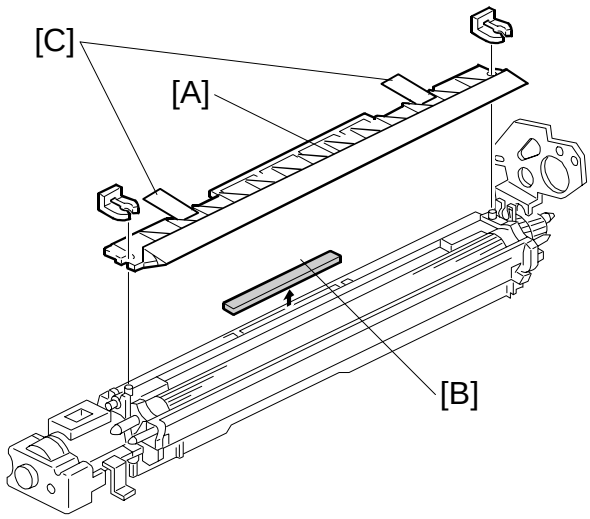
G035R552.WMF

1. Pull the PCU and development unit. (See Photoconductor Unit and Development Unit.)
2. Remove the PCU from the development unit [A] (2 screws).

NOTE: Be careful not to nick or scratch the development roller.

If you are temporarily installing a used development unit for test purposes for a long time, perform 2-11 after installation (see the SP mode table for details).

6.4.2 DEVELOPMENT FILTER

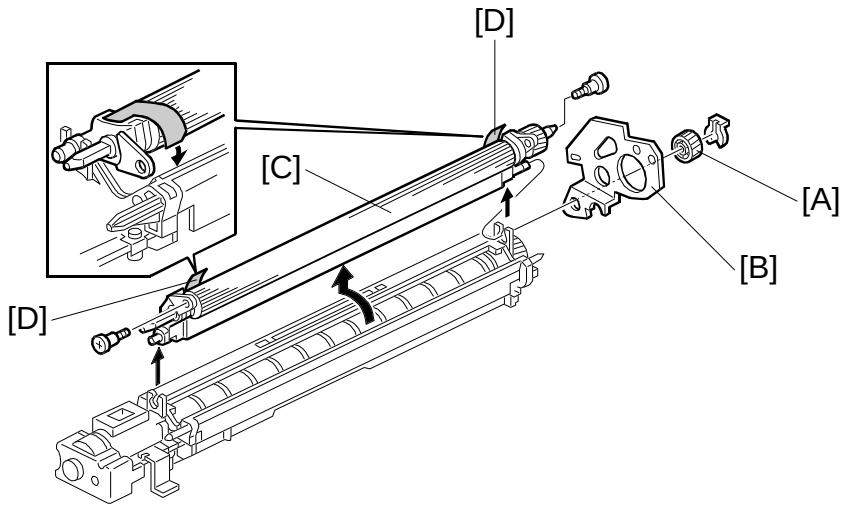


G035R551.WMF

1. Remove the development unit. (See Development Unit.)
2. Remove the upper development cover [A] (2 snap rings).
3. Remove the development filter [B]

NOTE: 1) Make sure that the surface with a red mark is facing up.
2) These seals [C] are for protection during transportation. Do not use these sheets after pealing them off (take off the sheets).

6.4.3 DEVELOPMENT ROLLER

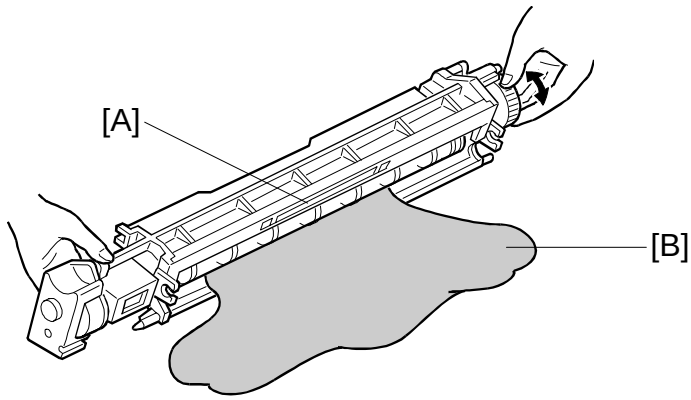


G035R550.WMF

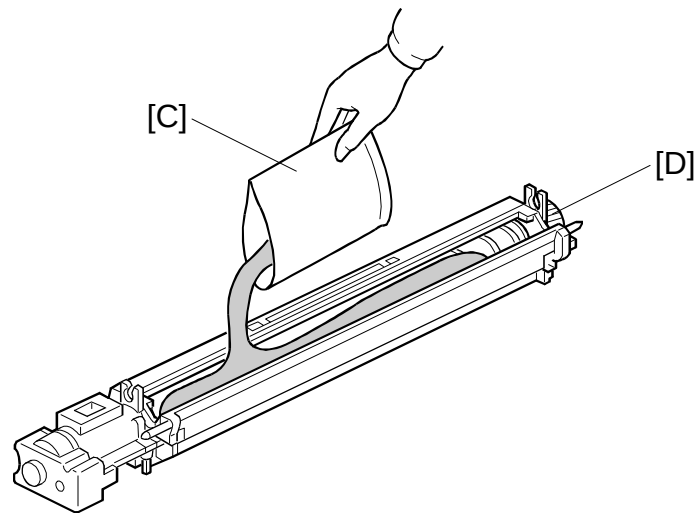
1. Remove the development unit and upper development cover. (See Development and Development Filter.)
2. Remove the gear [A] (1 snap ring) and the joint bracket [B].
3. Remove the development roller [C] (2 screws).

NOTE: 1) Be careful not to nick or scratch the development roller.
2) When re-installing the development roller, the side seals [D] should be inside the development unit case.

6.4.4 DEVELOPER

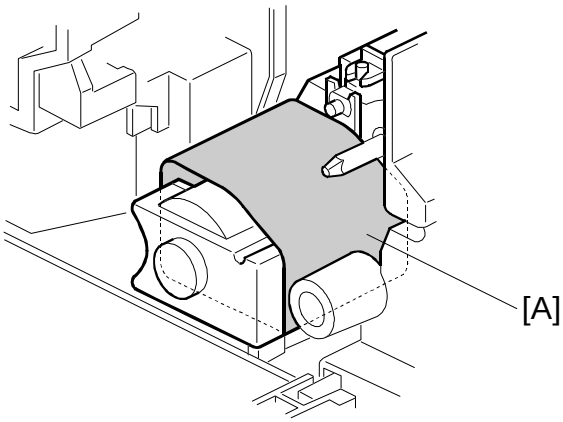


G035R404.WMF



G035R405.WMF

1. Remove the development unit and place it on a clean sheet. (See Development Unit.)
2. Remove the development roller. (See Development Roller.)
3. Turn over the development unit (the development filter [A] must be at the top as the unit turns over, as shown) and empty all the old developer [B]. Make sure that no developer remains on the development roller or in the unit.
   NOTE: 1) Dispose of the used developer in accordance with local regulations.
   2) Be careful not to nick or scratch the development roller.
4. Pour all the new developer [C] into the development unit. Then, rotate the gear [D] to distribute the developer evenly.



G035R518.WMF

5. Reassemble the development unit and cover the toner entrance hole with a piece of paper [A], as shown.
6. Reassemble the PCU and the development unit.
7. Install the PCU and development unit into the machine.
8. Turn on the main power switch, make sure that the machine has warmed up, then perform the TD sensor initial setting using SP2-10.
9. After performing the TD sensor initial setting, take out the sheet [A] from the development unit.

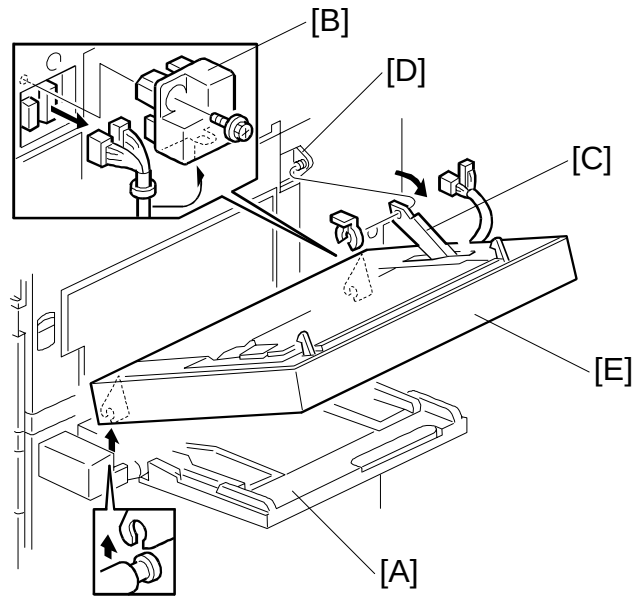
NOTE: When doing the TD sensor initial setting, cover the toner entrance hole with a piece of paper. This is because, if used toner in the PCU falls into the development unit through the toner entrance opening during TD sensor initial setting, Vref (toner density reference voltage) will not be measured correctly.

6.4.5 TD SENSOR

1. Remove the development unit and empty all the developer. (See Developer.)
2. Remove the TD sensor.
   NOTE: When installing the new TD sensor, secure it with double-sided tape.
3. Pour new developer into the development unit and perform the TD sensor initial setting using SP2-10.
   NOTE: When performing the TD sensor initial setting, cover the toner entrance hole with a piece of paper (see the above illustration).

6.5 DUPLEX

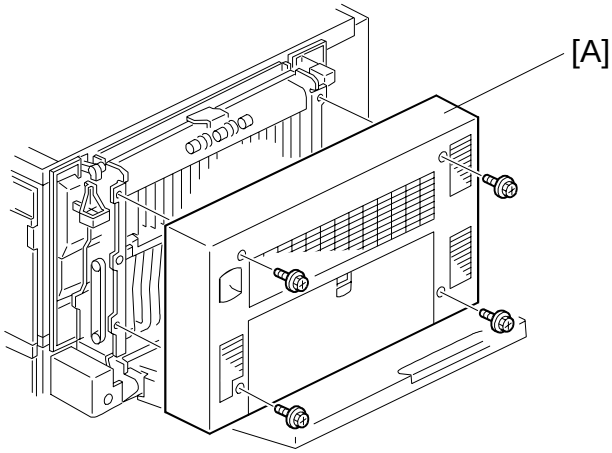
6.5.1 DUPLEX UNIT



G035R520.WMF

1. Open the by-pass feed table [A].
2. Remove the connector cover [B] (1 screw).
3. Remove the link [C] from the pin [D] (1 snap ring).
4. Remove the duplex unit [E] (2 connectors).

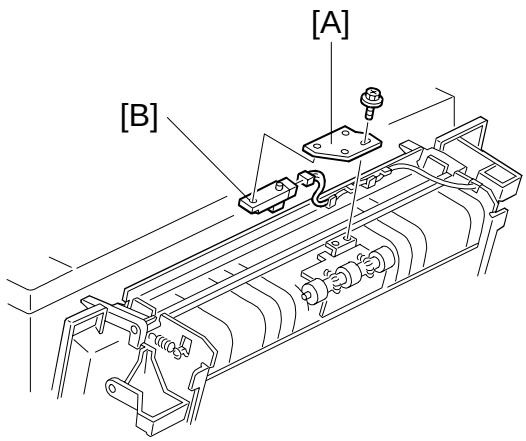
6.5.2 DUPLEX UNIT COVER



G035R521.WMF

1. Open the by-pass feed table.
2. Remove the duplex unit cover [A] (4 screws).

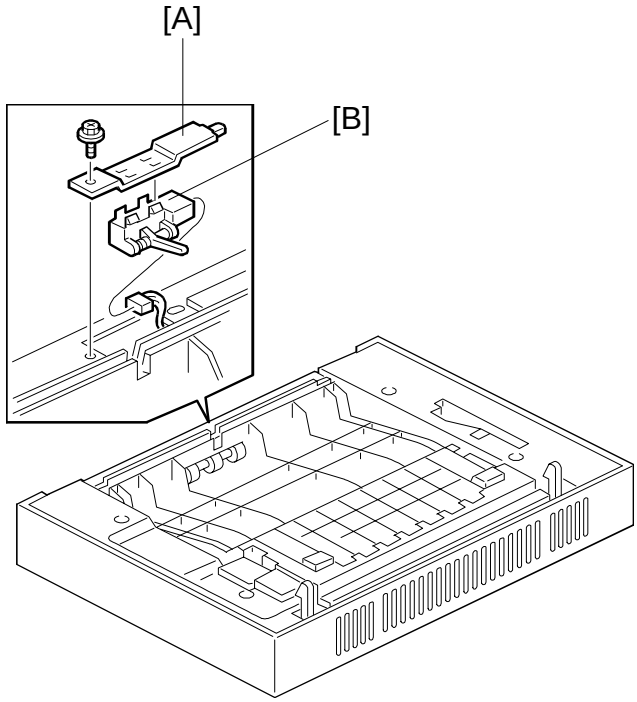
6.5.3 ENTRANCE SENSOR



G035R001.WMF

1. Remove the duplex unit cover (See Duplex Unit Cover).
2. Remove the sensor holder [A] (1 screw).
3. Replace the entrance sensor [B] (1 connector).

6.5.4 EXIT SENSOR

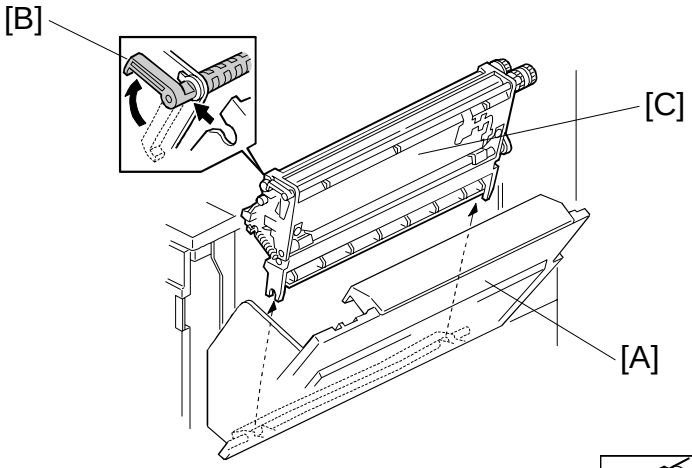


G035R002.WMF

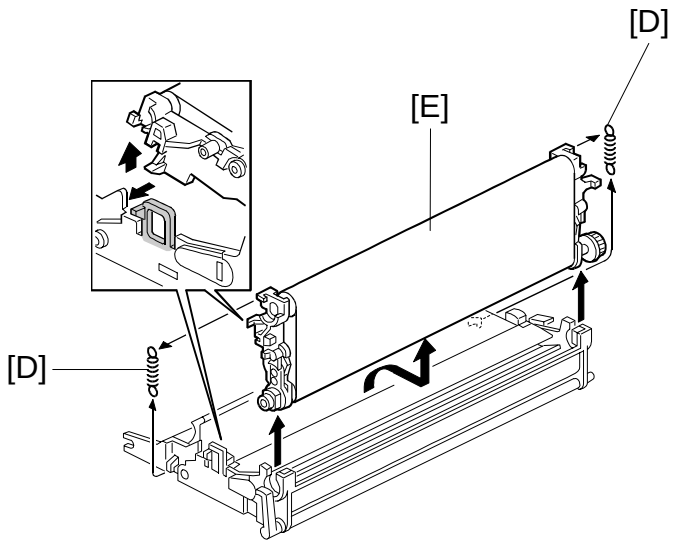
1. Remove the duplex unit. (See Duplex Unit.)
2. Remove the sensor bracket [A] (1 screw).
3. Replace the exit sensor [B] (1 connector).

6.6 TRANSFER UNIT

6.6.1 TRANSFER BELT UNIT



G035R501.WMF

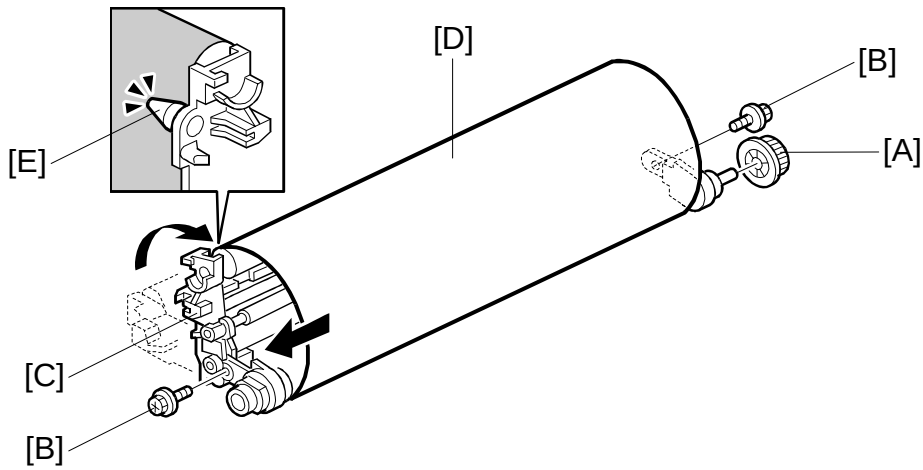


G035R502.WMF

NOTE: Do not keep the right cover open for a long time, to prevent the drum from being exposed to direct light. When keeping the right cover open for a long time, cover the drum with paper, or remove the PCU then cover the PCU with paper.

1. Open the by-pass feed table.
2. Open the duplex unit.
3. Open the right cover [A].
4. Release the release lever [B] then remove the transfer unit [C].
5. Remove the springs [D].
6. Remove the transfer belt unit [E] (1 hook).
   NOTE: Do not touch the transfer belt surface.

6.6.2 TRANSFER BELT

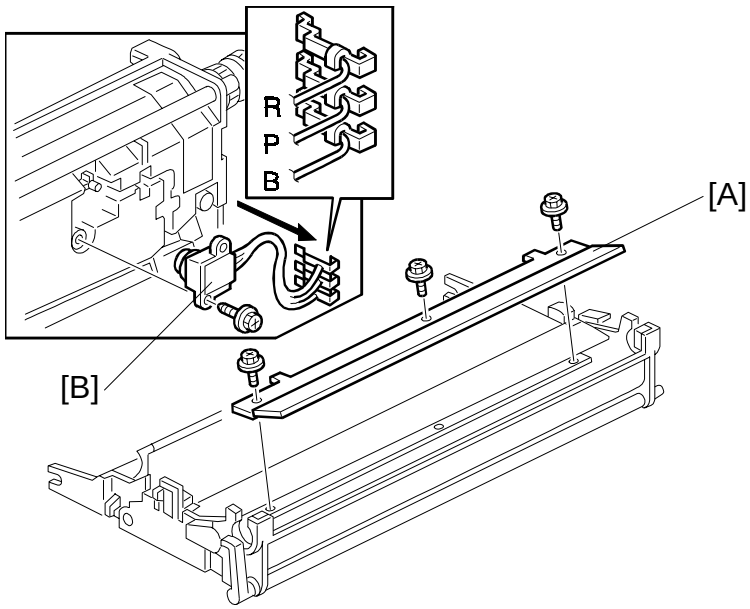


G035R504.WMF

1. Remove the transfer belt unit. (See Transfer Belt Unit.)
2. Remove the belt drive gear [A].
3. Remove the screws [B] on both sides and turn the belt holder [C] until it is vertical.
4. Remove the transfer belt [D].

NOTE: 1) Do not touch the transfer belt surface with bare hands.
2) Before installing the new transfer belt, clean all the rollers and shafts with alcohol to prevent the belt from slipping.
3) When re-installing the transfer belt, make sure that the belt is under the pin [E].
4) When re-installing, to avoid damage to the transfer belt, manually turn the rollers and check that the new transfer belt is not running over the edge of any of the rollers.

6.6.3 TRANSFER BELT CLEANING BLADE/TONER OVERFLOW SENSOR



G035R503.WMF

Transfer Belt Cleaning Blade

1. Remove the transfer belt. (See Transfer Belt.)
2. Remove the transfer belt cleaning blade [A] (3 screws).

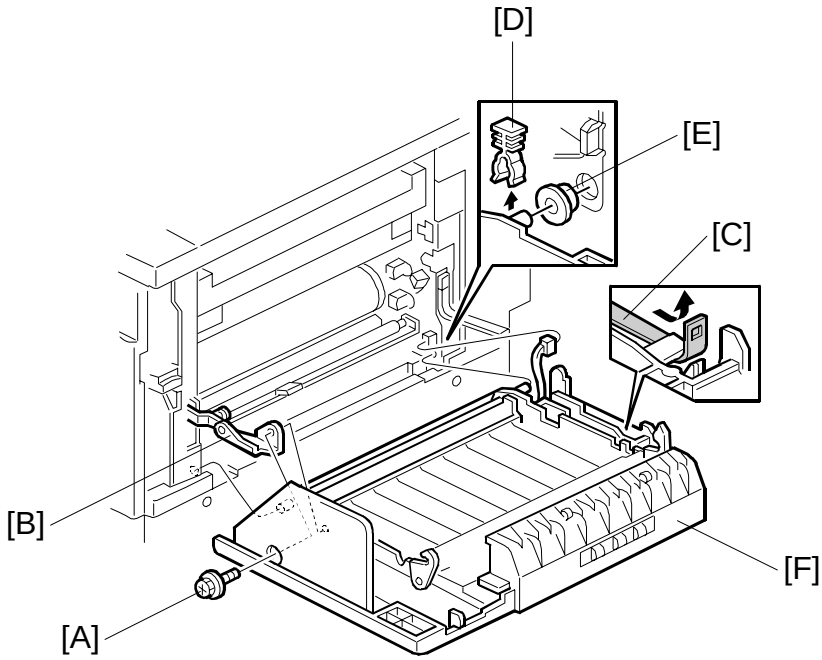
NOTE: 1) Do not touch the edge of the new blade.
2) Check that there is no dust/no damage on the edge of the new blade.

Toner Overflow Sensor

1. Remove the transfer belt cleaning blade.
2. Turn over the transfer unit and empty the used toner in the transfer unit.
3. Remove the toner overflow sensor [B] (1 screw, 3 terminal wires).

NOTE: When re-installing the terminal wires, the wire color order is red, purple, and blue, from the top.

6.6.4 RIGHT COVER



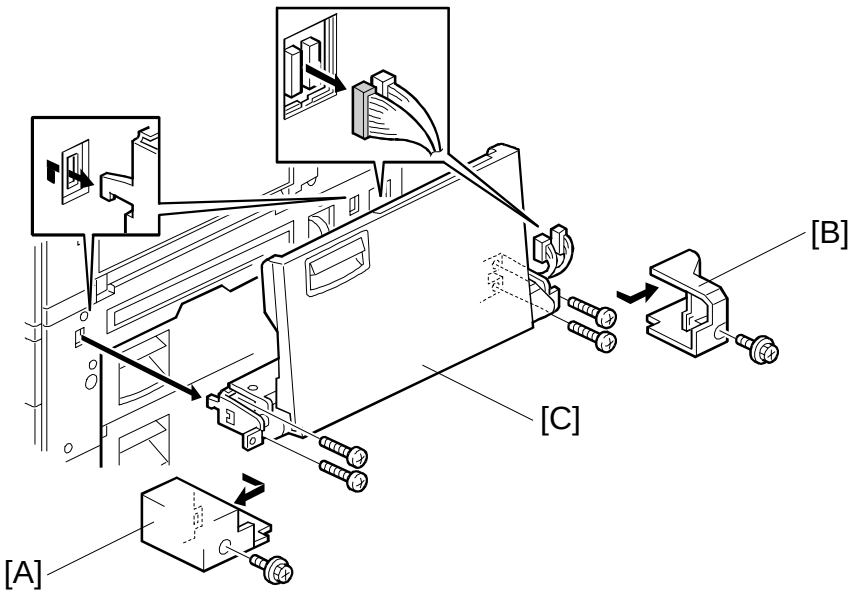
G035R936.WMF

NOTE: To prevent the drum from being exposed to direct light, DO NOT keep the right cover open for a long time. If it is necessary to keep the right cover open for a long time, cover the drum with paper, or remove the PCU and cover it with paper.

1. Remove the duplex unit. (See Duplex Unit.)
2. Remove the transfer belt unit. (See Transfer Belt Unit.)
3. Remove the screw [A] that secures the link [B].
4. Remove the unit band [C].
5. Remove the clip [D] and bushing [E].
6. Remove the right cover [F] (1 connector).

6.7 BY-PASS FEED

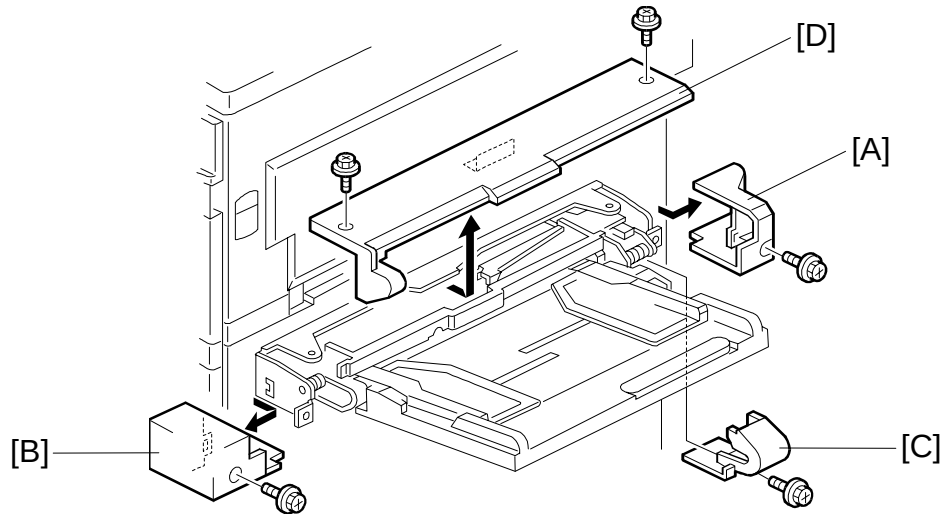
6.7.1 BY-PASS FEED UNIT



G035R003.WMF

1. Remove the duplex unit. (See Duplex Unit.)
2. Remove the front cover [A] and rear cover [B].
3. Remove the by-pass feed unit [C] (4 screws, 2 connectors).

6.7.2 BY-PASS FEED UNIT COVERS



G035R004.WMF

Rear Cover

1. Remove the rear cover [A] (1 screw).

Front Cover

1. Remove the front cover [B] (1 screw).

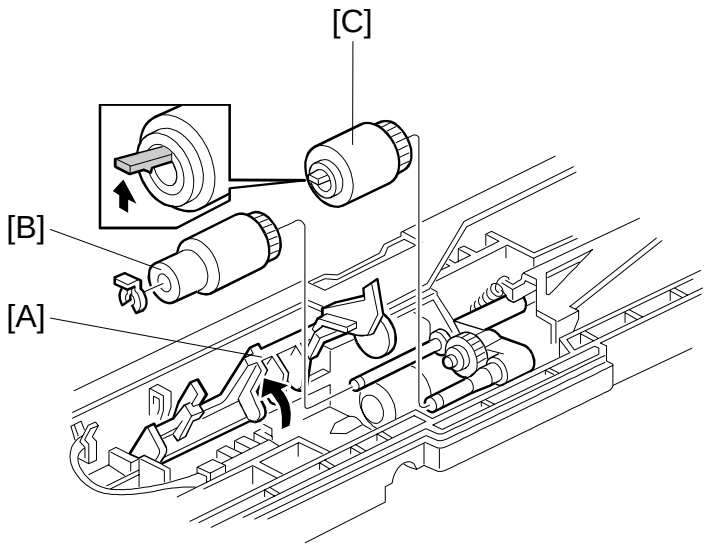
Hinge Cover

1. Remove the hinge cover [C] (1 screw).

Upper Cover

1. Remove the hinge cover.
2. Open the duplex unit.
3. Remove two screws for the upper cover.
4. Close the duplex unit and pull out the upper cover [D].

6.7.3 PAPER FEED AND PICK-UP ROLLER



G035R005.WMF

1. Remove the upper cover. (See Covers.)
2. Lifts up the paper end feeler [A].
   NOTE: When lifted, the paper end feeler locks into position. Therefore, make sure to move it back to its original position before re-installing the upper cover.

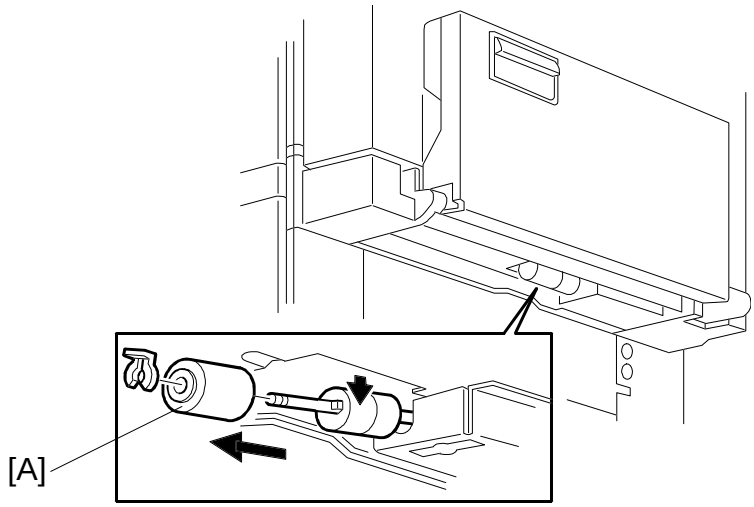
Paper Feed Roller

3. Replace the paper feed roller [B] (1 snap ring).

Pick-up Roller

3. Replace the pick-up roller [C].

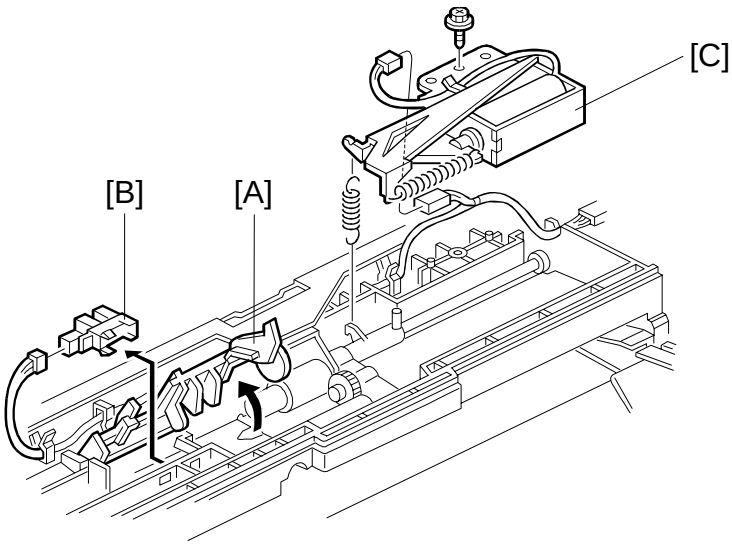
6.7.4 SEPARETION ROLLER



G035R006.WMF

1. Close the by-pass table.
2. Remove the separation roller [A] from the bottom (1 snap ring).

6.7.5 PAPER END SENSOR AND PICK-UP SELENOID



G035R007.WMF

1. Remove the upper cover. (See Covers.)

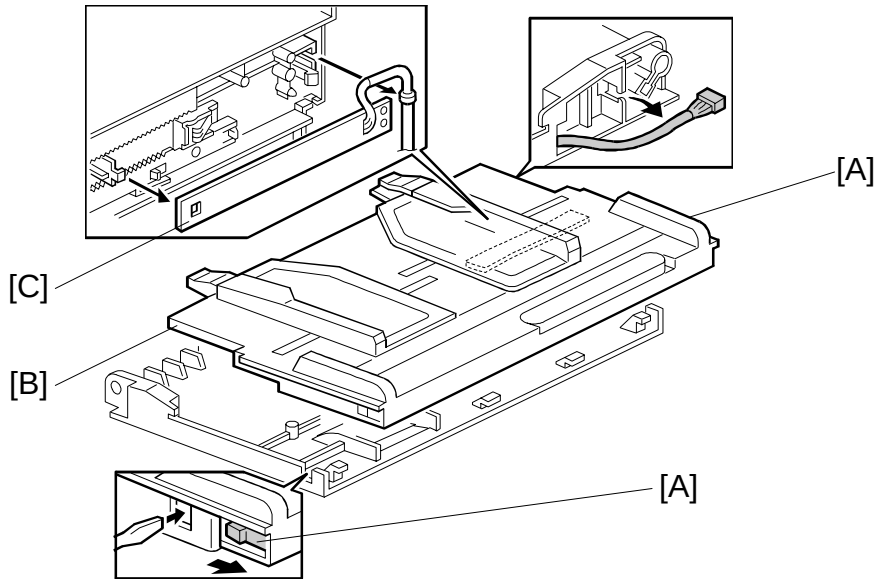
Paper End Sensor

2. Lift up the paper end feeler [A].
   NOTE: When lifted, the paper end feeler locks into position. Therefore, make sure to move it back to its original position before re-installing the upper cover.
3. Replace the paper end sensor [B] (1 connector).

Pick-up Solenoid

2. Remove the pick-up solenoid [C] (1 screw, 1 spring, 1 connector).

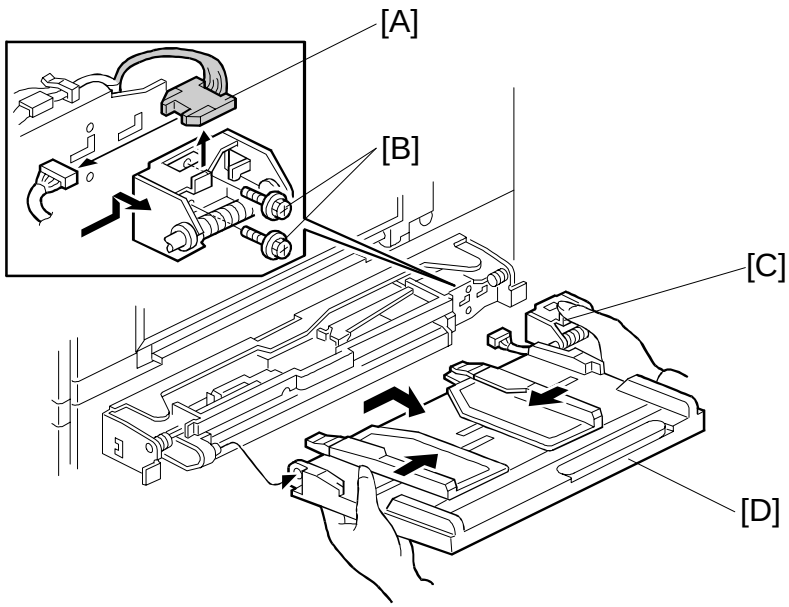
6.7.6 PAPER SIZE SENSOR BOARD



G035R008.WMF

1. Release hooks [A] and remove the by-pass table [B] (1 connector).
2. Replace the paper size sensor board [C].
   NOTE: When removing the paper size sensor board, be careful not to break its hook.

6.7.7 BY-PASS TABLE

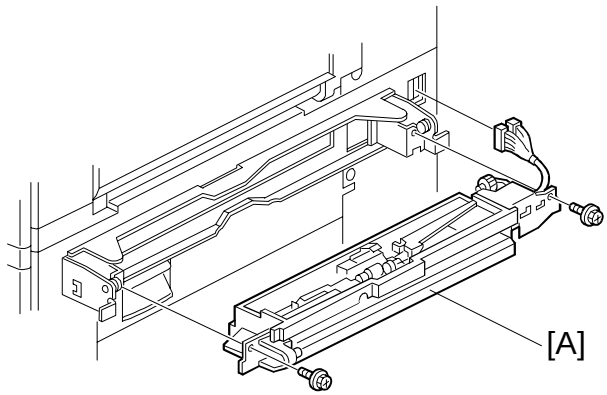


G035R009.WMF

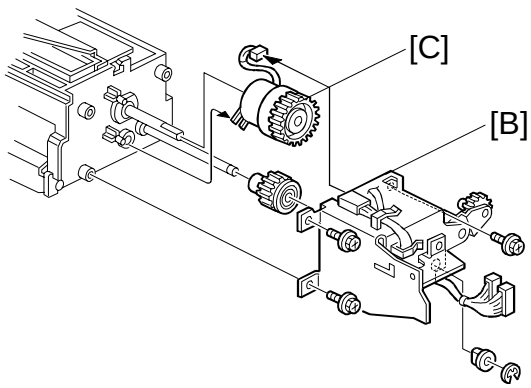
1. Remove the hinge cover. (See By-pass Feed Unit Covers.)
2. Disconnect the connector [A].
3. Remove the two screws [B]
4. Hold the spring bracket [C] and remove the by-pass table [D].

CAUTION: Pressure is applied to the spring bracket, so when removing the by-pass tray, hold the spring bracket by hand as shown.

6.7.8 PAPER FEED CLUTCH



G035R505.WMF

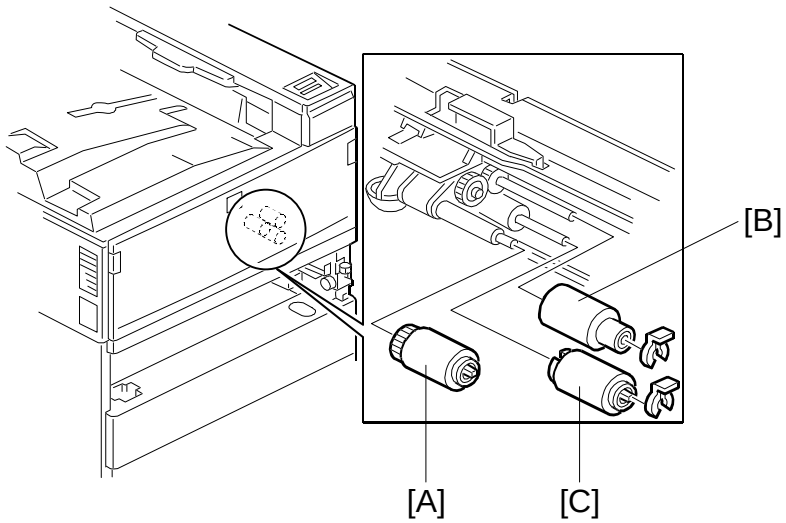


G035R010.WMF

1. Remove the by-pass table. (See By-pass Table.)
2. Remove the paper feed unit [A] (2 screws, 1 connector).
3. Remove the rear bracket [B] (3 screws, 1 clip, 1 bushing).
4. Replace the paper feed clutch [C] (1 connector)

6.8 PAPER FEED

6.8.1 PICK-UP, SEPARATION, AND FEED ROLLERS

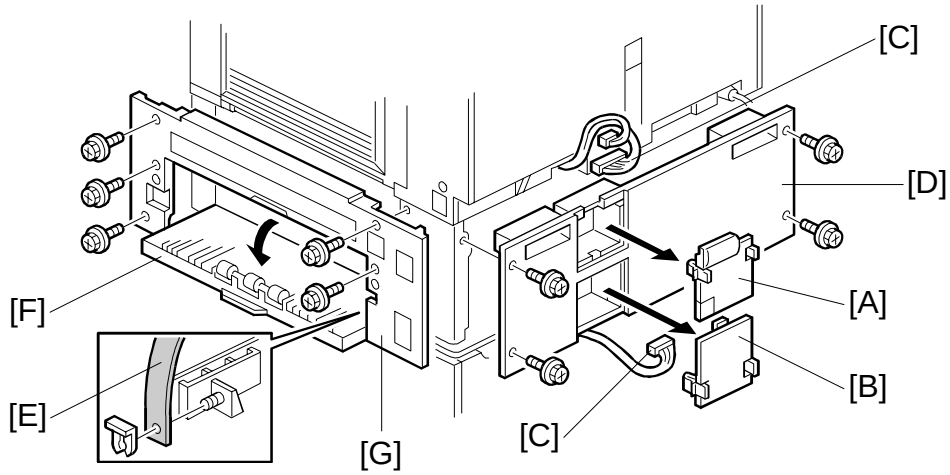


G035R548.WMF

1. Remove the paper tray.
2. Remove the pick-up roller [A].
3. Remove the feed [B] and separation rollers [C] (1 clip each).

NOTE: Do not touch the roller surface with bare hands.
After installing the new rollers, do SP2-25-2 for the appropriate paper tray.

6.8.2 LOWER RIGHT COVER/LOWER REAR COVER

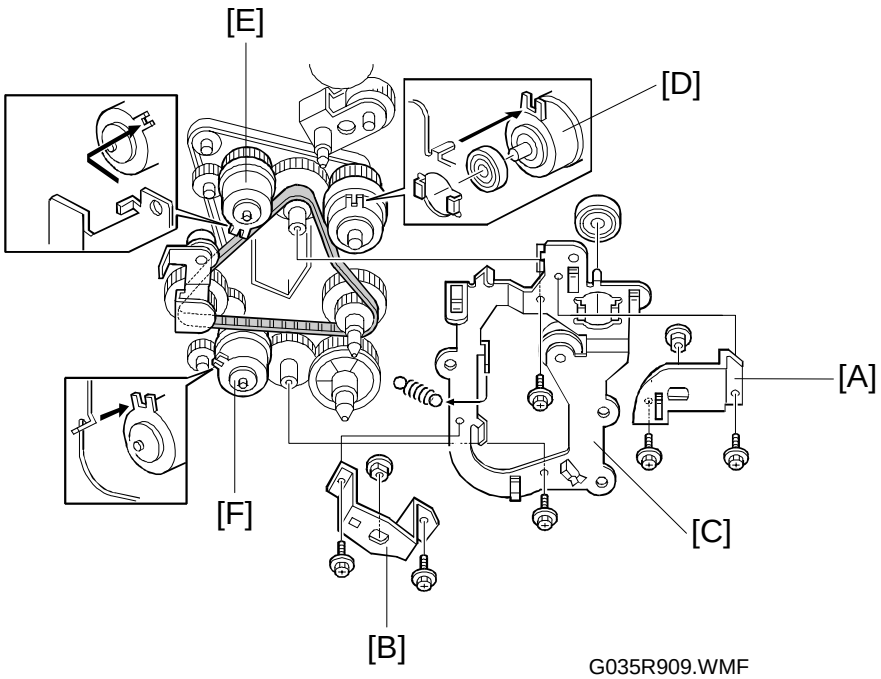


G035R908.WMF

NOTE: If the optional LCT has been installed, remove the LCT before doing the following procedure.

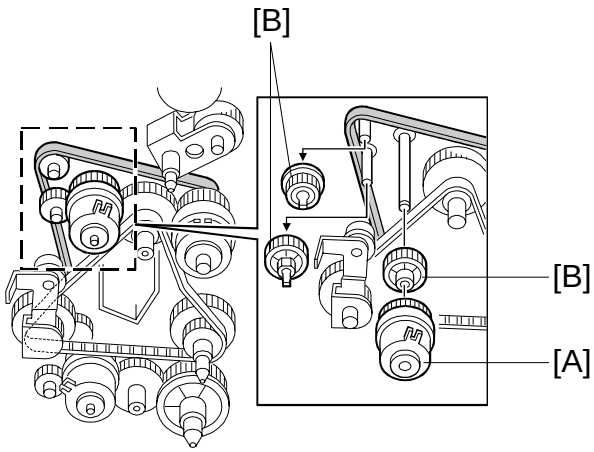
1. Remove the duplex unit. (See Duplex Unit.)
2. Remove the by-pass feed unit. (See By-pass Feed Unit.)
3. Remove the upper connector cover [A] and lower connector cover [B] then disconnect the harnesses [C].
4. Remove the lower rear cover [D] (4 screws).
5. Remove the unit band [E] (1 clip) and remove the vertical transport cover [F].
6. Remove the lower right cover [G] (5 screws).

6.8.3 RELAY/UPPER PAPER FEED/LOWER PAPER FEED CLUTCHES

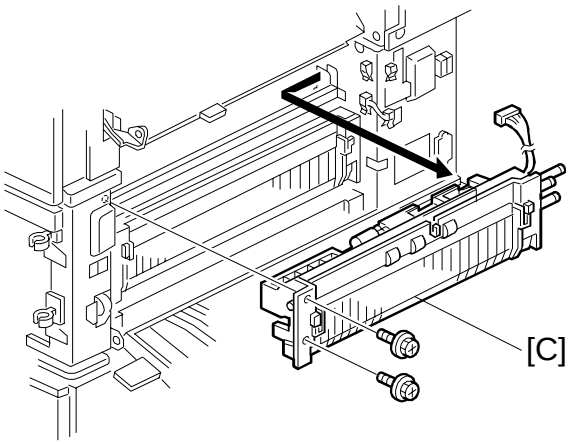


1. Remove the lower rear cover. (See Lower Right Cover/Lower Rear Cover.)
2. Remove the first paper feed clutch bracket [A] (2 screws, 1 bushing).
3. Remove the second paper feed clutch bracket [B] (2 screws, 1 bushing).
4. Remove the drive bracket [C] (2 screws, 1 spring, 1 bearing).
5. Remove the relay clutch [D] (1 connector).
6. Remove the upper paper feed clutch [E] (1 connector).
7. Remove the lower paper feed clutch [F] (1 connector).

6.8.4 UPPER PAPER FEED UNIT



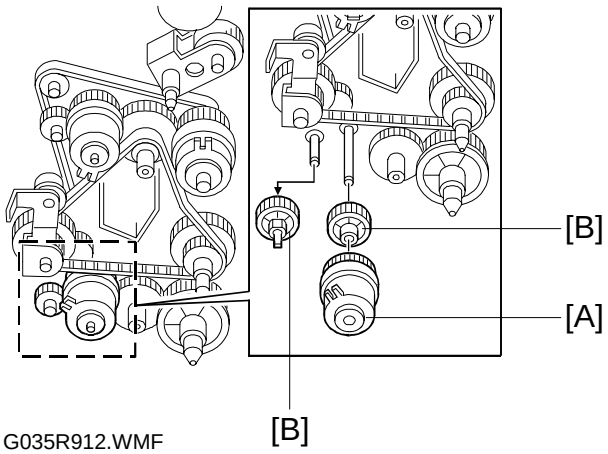
G035R910.WMF



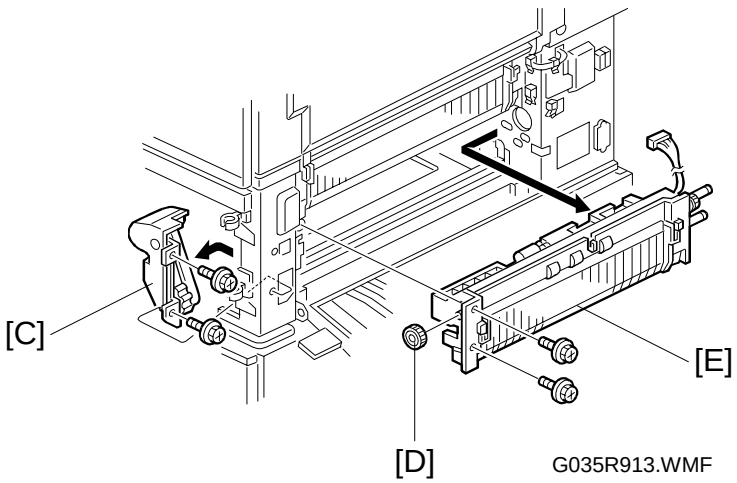
G035R911.WMF

1. Remove the upper paper feed clutch [A]. (See Relay/Upper Paper Feed/Lower Paper Feed Clutches.)
2. Remove three relay gears [B].
3. Remove the lower right cover. (See Lower Right Cover/Lower Rear Cover.)
4. Remove the upper paper feed unit [C] (2 screws, 1 connector).

6.8.5 LOWER PAPER FEED UNIT



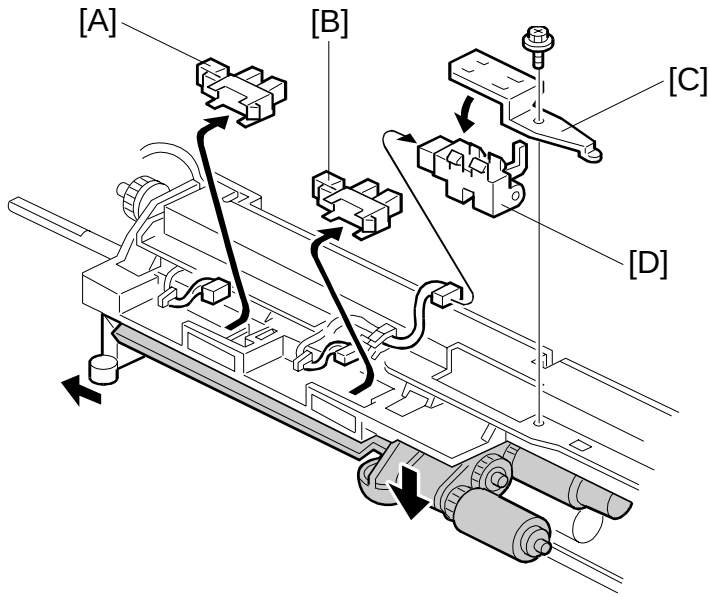
G035R912.WMF



G035R913.WMF

1. Remove the lower paper feed clutch [A] (See Relay/Upper Paper Feed/Lower Paper Feed Clutches.)
2. Remove two relay gears [B].
3. Remove the paper trays.
4. Remove the lower right cover. (See Lower Right Cover/Lower Rear Cover.)
5. Remove the cover [C] (2 screws).
6. Remove the gear [D].
7. Remove the lower paper feed unit [E] (2 screws, 1 connector).

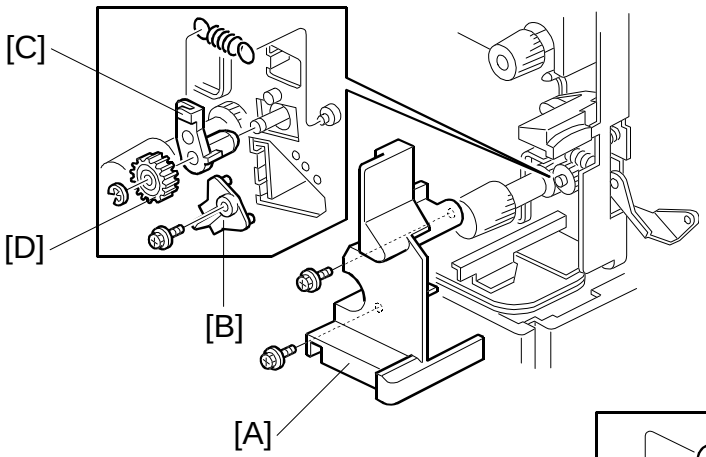
6.8.6 PAPER END/PAPER HEIGHT/RELAY SENSORS



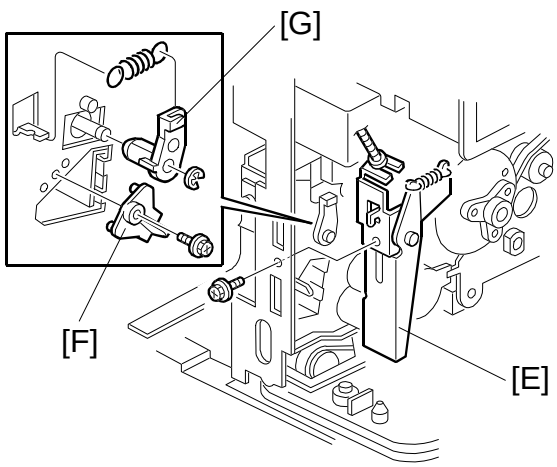
G035R914.WMF

1. Remove the appropriate paper feed unit. (See Upper or Lower Paper Feed Unit.)
2. Remove the paper height sensor [A] (1 connector).
3. Remove the paper end sensor [B] (1 connector).
4. Remove the relay sensor bracket [C] (1 screw, 1 connector).
5. Remove the relay sensor [D].

6.8.7 REGISTRATION SENSOR

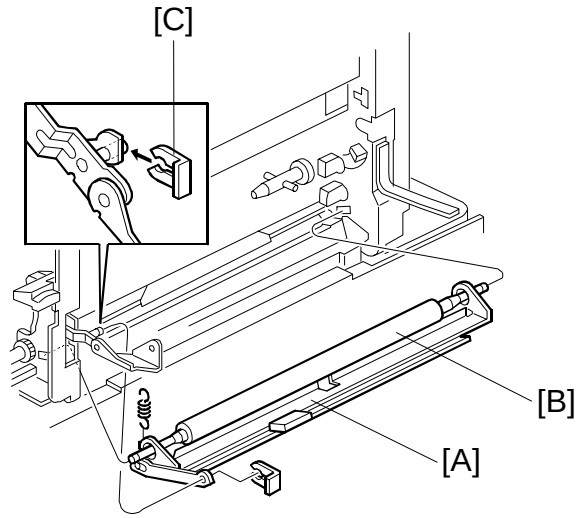


G035R932.WMF

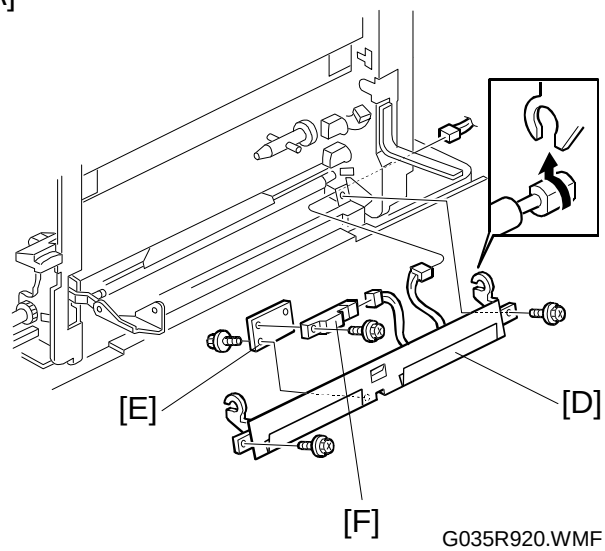


G035R933.WMF

1. Remove the front cover. (See Laser Unit.)
2. Remove the connector cover and rear cover. (See Covers.)
3. Remove the right rear cover. (See Registration Clutch and Transfer Belt Clutch.)
4. Remove the PCU and development unit. (See PCU and Development Unit.)
5. Remove the transfer belt unit and right cover. (See Transfer Belt and Right Cover.)
6. Remove the inner cover [A] (2 screws).
7. Remove the front registration holder [B] (1 screw).
8. Remove the registration roller bushing [C] and front registration roller gear [D] (1 E-ring, 1 spring).
9. Remove the right cover switch bracket [E].
10. Remove the rear registration holder [F] (1 screw).
11. Remove the registration roller bushing [G] (1 E-ring, 1 spring).



G035R919.WMF



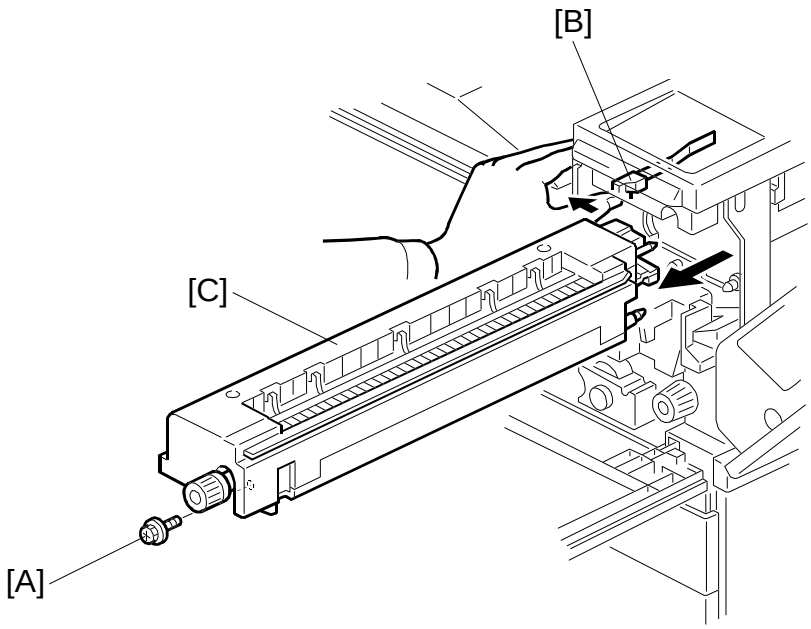
G035R920.WMF

12. Remove the guide plate [A] and registration roller [B] (1 spring, 1 clip).
    NOTE: When re-installing the clip [C], its position must be as shown.
13. Remove the registration guide plate [D] (2 screws, 1 connector).
14. Remove the sensor bracket [E] (1 screw).
15. Remove the registration sensor [F] (1 screw, 1 connector).

6.9 FUSING

6.9.1 FUSING UNIT

⚠CAUTION
Allow time for the unit to cool before doing the following procedure.

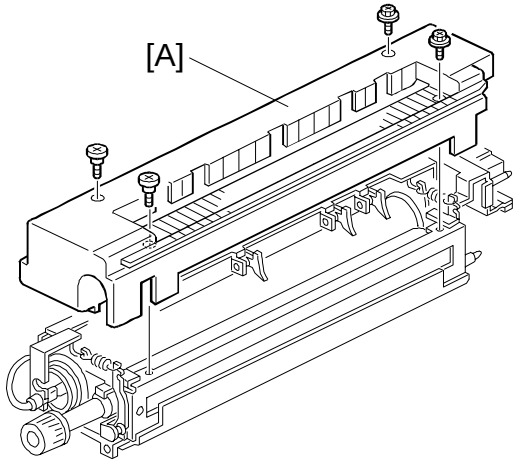


G035R549.WMF

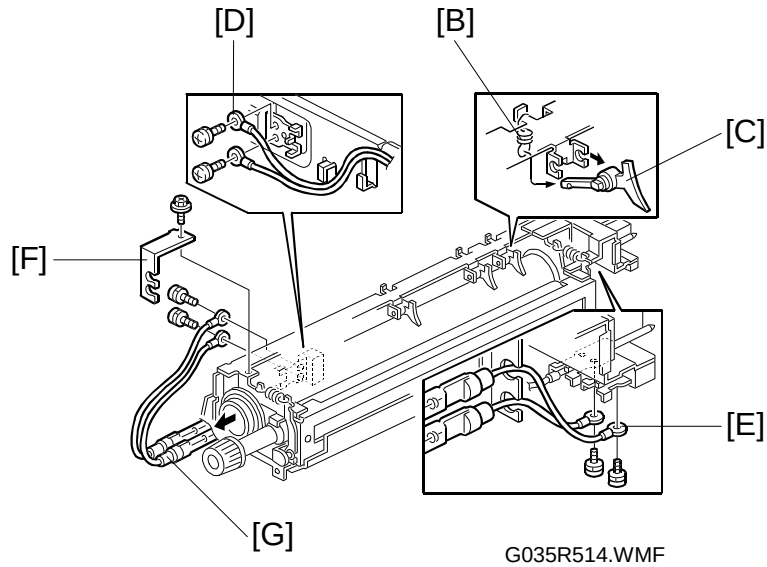
1. Open the front cover and right cover.
2. Open the duplex unit.
3. Remove the screw [A].
4. Release the fusing lever [B] and slide out the fusing unit [C].

NOTE: After removing the fusing unit, close the right cover.

6.9.2 HOT ROLLER STRIPPERS AND FUSING LAMP



G035R553.WMF

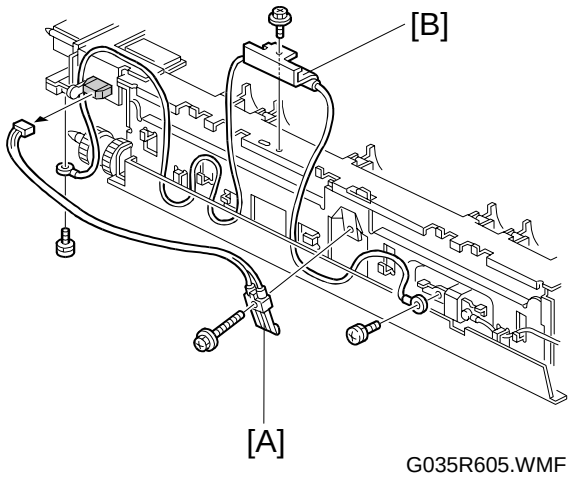


G035R514.WMF

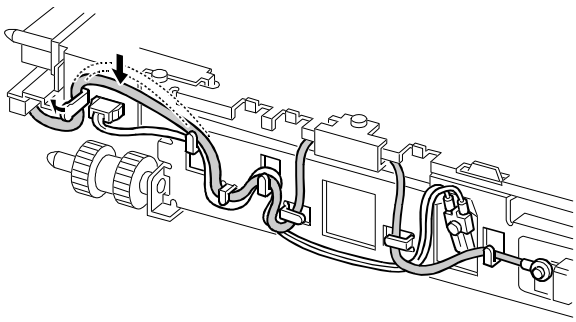
1. Remove the fusing upper cover [A] (4 screws).
2. Remove the spring [B]. Then, remove the hot roller stripper [C].
3. Remove the front fusing lamp wire [D] (1 screw for 115 V machines, 2 screws for 230 V machines).
4. Remove the rear fusing lamp wire [E] (1 screw for 115 V machines, 2 screws for 230V machines).
5. Remove the front lamp holder [F] (1 screw).
6. Remove the fusing lamp [G] (1 lamp for 115 V machines, 2 lamps for 230 V machines).

NOTE: Do not touch the glass part of the fusing lamp with bare hands.

6.9.3 THERMISTOR AND THERMOFUSE



G035R605.WMF

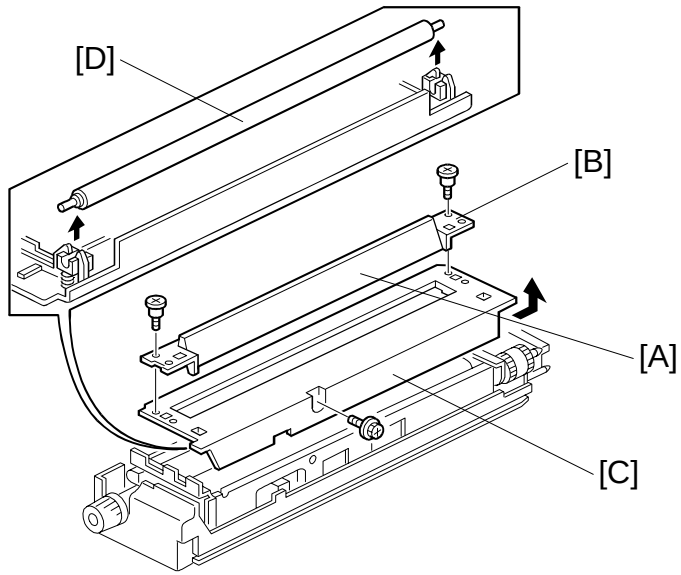


G035R525.WMF

1. Remove the fusing upper cover. (See Hot Roller Strippers and Fusing Lamp.)
2. Remove the thermistor [A] (1 screw, 1 connector).
3. Remove the thermofuse [B] (3 screws).

Route the cable of the thermistor and thermofuse as shown.

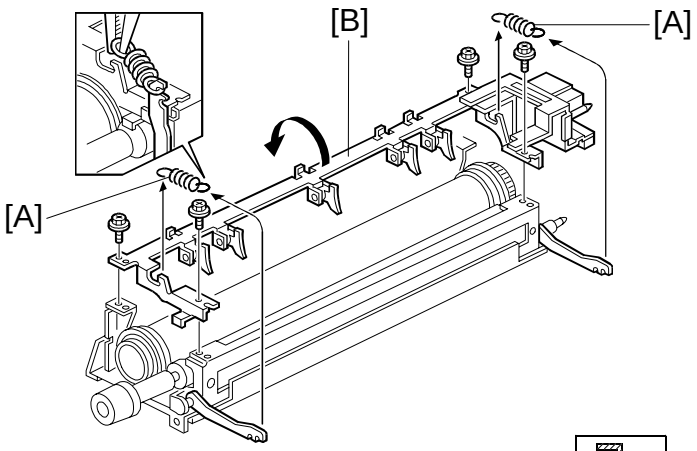
6.9.4 CLEANING ROLLER



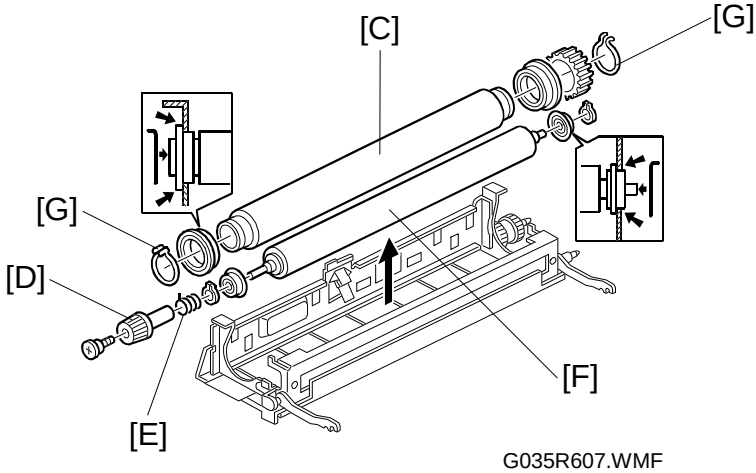
G035R604.WMF

1. Remove the fusing unit. (See Fusing Unit.)
2. Remove the fusing entrance guide [A] (2 screws).
   NOTE: The standard position of the fusing entrance guide is the upper position, using the lower screw holes [B]
3. Remove the lower fusing cover [C] (1 screw).
   NOTE: When removing the lower fusing cover, be careful not to drop the cleaning roller onto the hot roller.
4. Replace the cleaning roller [D].

6.9.5 HOT ROLLER AND PRESSURE ROLLER



G035R606.WMF



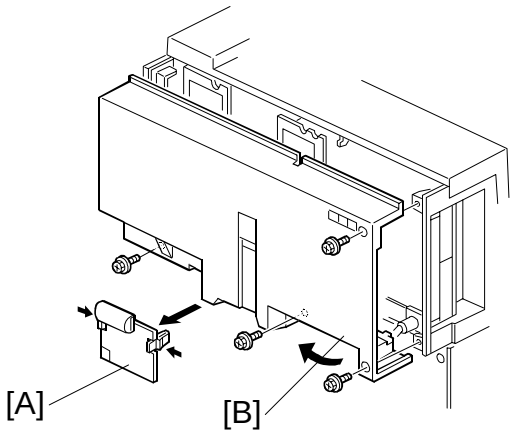
G035R607.WMF

1. Remove the fusing lamp. (See Hot Roller Strippers and Fusing Lamp.)
2. Remove the pressure springs [A].
3. Remove the hot roller stripper bracket [B] (4 screws).
4. Remove the hot roller assembly then replace the hot roller [C] (2 C-rings, 1 gear, 2 bushings)
5. Remove the pressure roller assembly.
6. Remove the fusing knob [D] (1 screw).
7. Remove the spring [E].
8. Replace the pressure roller [F] (2 C-rings, 2 bushings).

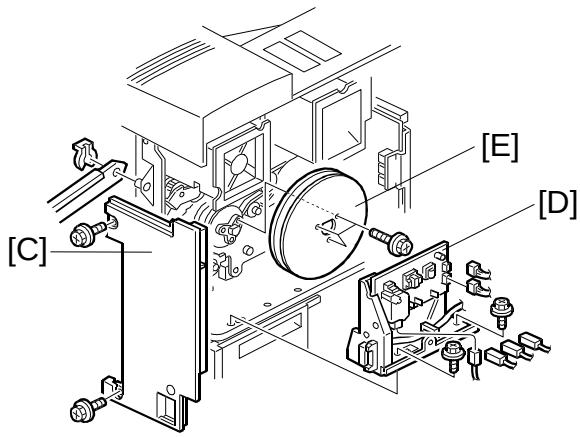
NOTE: 1) Before installing the new hot roller, peel off 3 cm (1.2 inches) from both ends of the protective sheet on the new roller.
2) Do not touch the surface of the rollers.
3) Be careful not to damage the surface of the hot roller.
4) The standard pressure roller position is the upper position.
5) When re-installing the hot roller assembly and pressure roller assembly, make sure that the flange position of the bushings is as shown.
6) When re-installing the C-rings [G] of the hot roller, make sure that the position of the C-rings is as shown.

6.10 DRIVE AREA

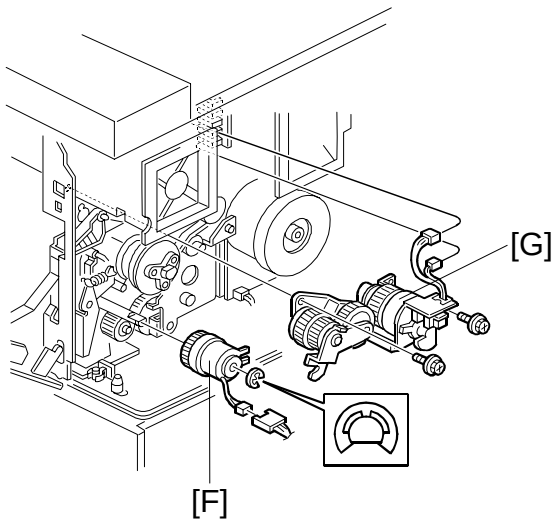
6.10.1 REGISTRATION CLUTCH AND TRANSFER BELT CLUTCH



G035R539.WMF



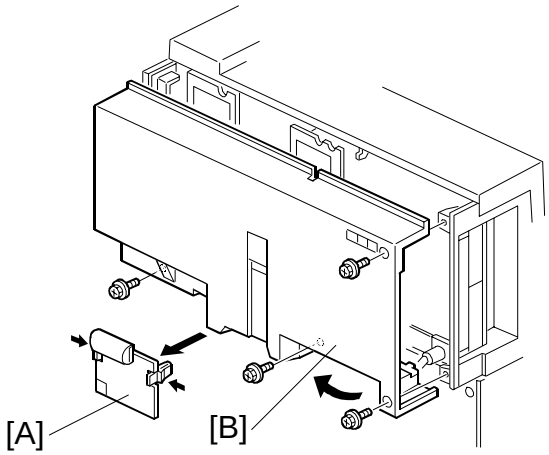
G035R905.WMF



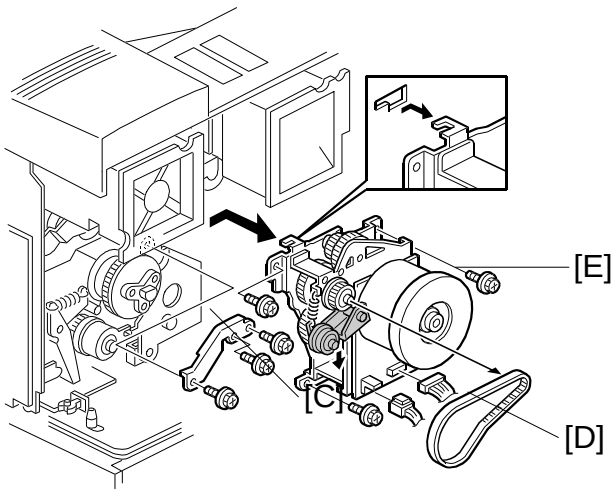
G035R906.WMF

1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. **If the optional LCT has been installed:**
   Remove the harness cover (1 screw) and disconnect the LCT interface harnesses
3. Remove the right rear cover [C] (2 screws).
4. Remove the power pack bracket [D] (2 screws, 6 connectors).
5. Remove 2 flywheels [E] (3 screws).
6. Remove the registration clutch [F] (1 E-ring, 1 connector).
7. Remove the transfer belt clutch assembly [G] (2 screws, 2 connectors).

6.10.2 MAIN MOTOR



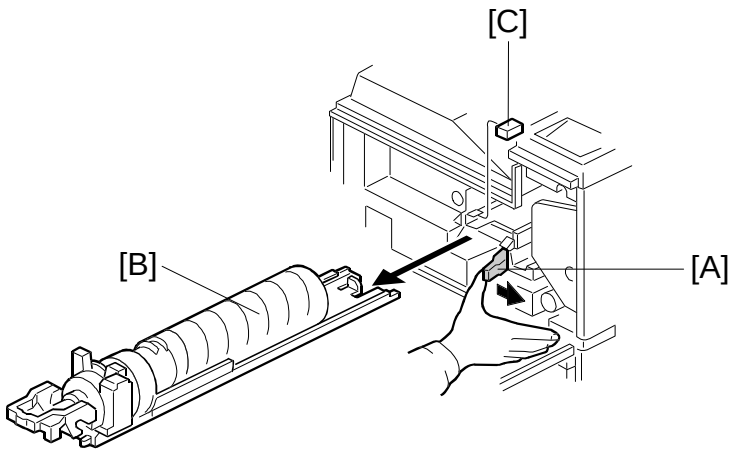
G035R539.WMF



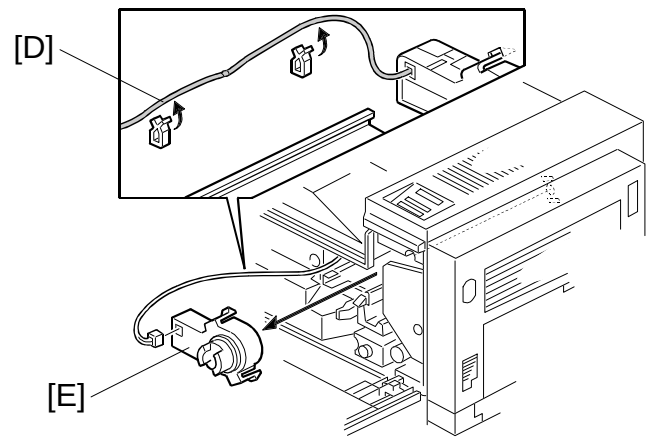
G035R907.WMF

1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Remove the power pack bracket and fly wheels. (See Registration Clutch and Transfer Belt Clutch.)
3. Remove the bracket [C] (3 screws).
4. Remove the timing belt [D].
5. Remove the main motor [E] (3 screws, 2 connectors).

6.10.3 TONER BOTTLE MOTOR



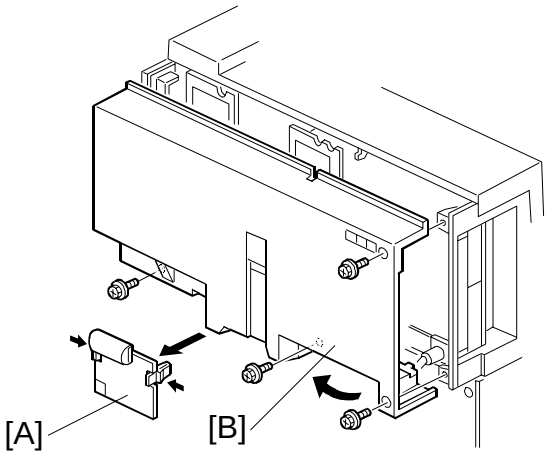
G035R546.WMF



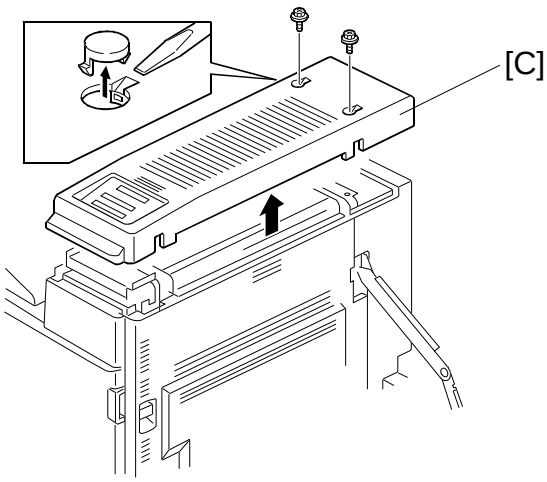
G035R545.WMF

1. Release the toner bottle holder lever [A], then slide out the toner bottle holder [B].
2. Remove the toner bottle [B].
3. Remove the stopper [C] for the holder, then take out the toner bottle holder.
4. Remove the motor harness from the two wire clamps [D].
5. Remove the toner bottle motor [E] (2 hooks).
6. Disconnect the harness from the motor.

6.11 COVERS



G035R539.WMF



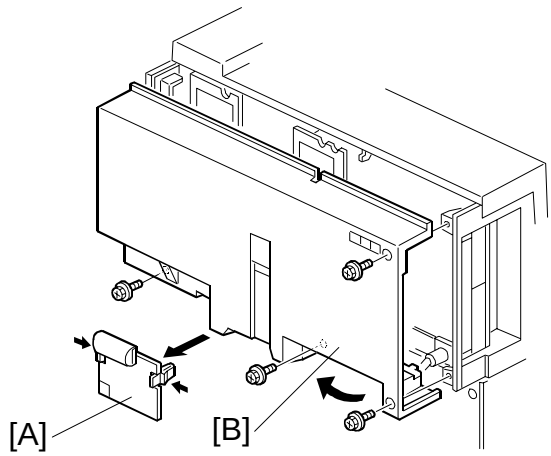
G035R526.WMF

Connector Cover and Rear Cover

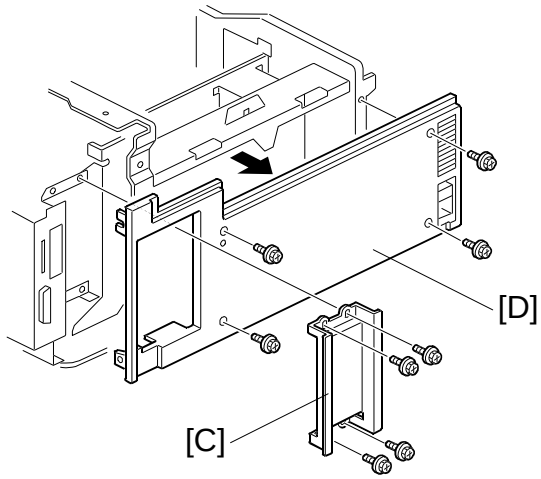
1. Remove the connector cover [A] and rear cover [B] (4 screws).

Operation Panel Cover

1. Remove the operation panel cover [C] (2 caps, 2 screws).



G035R539.WMF



G035R527.WMF

Upper Cover

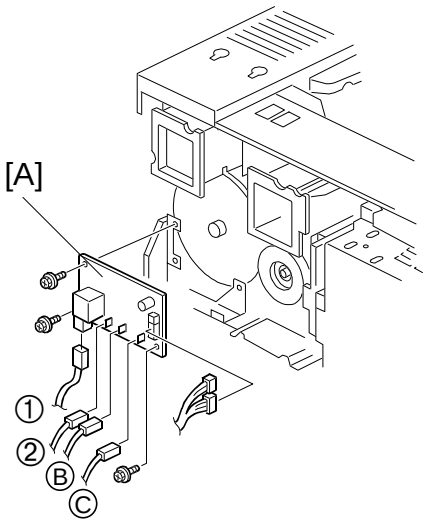
1. Open the front cover.
2. Remove the connector cover and rear cover. (See Connector Cover and Rear Cover.)
3. Remove the operation panel cover. (See Operation Panel Cover.)
4. Remove the small upper cover [A] (1 screw) and upper cover [B] (3 screws).

Left Cover and Printer Controller Cover

1. Open the front cover.
2. Remove the connector cover and rear cover. (See Connector Cover and Rear Cover.)
3. Remove the operation panel cover. (See Operation Panel Cover.)
4. Remove the small upper cover and upper cover. (See Upper Cover.)
5. Remove the printer controller cover [C] (4 screws) and the left cover [D] (4 screws).

6.12 PCBs

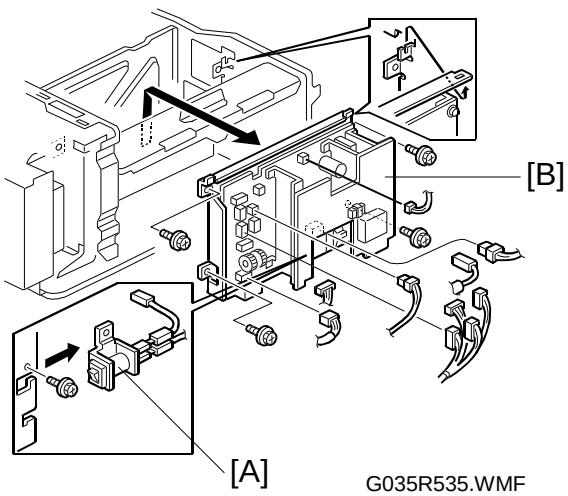
6.12.1 POWER PACK



G035R536.WMF

1. Remove the connector cover and rear cover. (See Covers.)
2. Remove the power pack [A] (3 screws, 6 connectors).

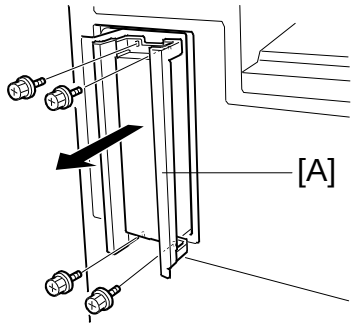
6.12.2 PSU



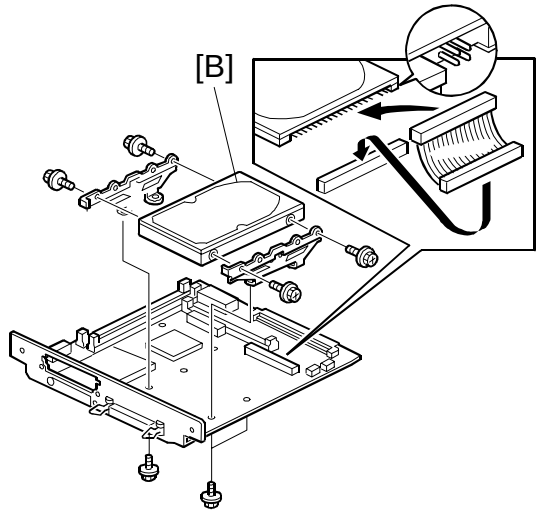
G035R535.WMF

1. Open the front cover.
2. Remove the operation panel, connector, rear, upper and left covers. (See Covers.)
3. **For 230 V machines:**
   Remove the circuit breaker [A] (1 screw, 1 connector).
4. Remove the PSU [B] (4 screws, all connectors).

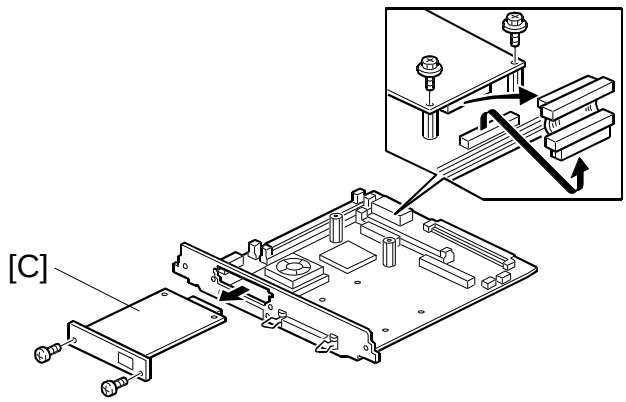
6.12.3 PRINTER CONTROL BOARD AND NIB



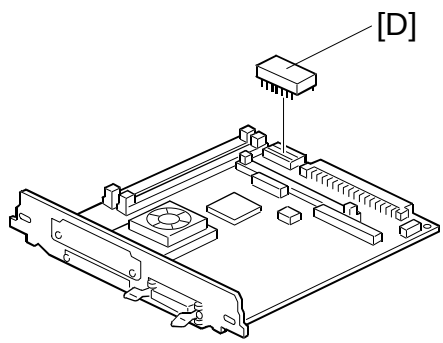
G035R011.WMF



G035R014.WMF



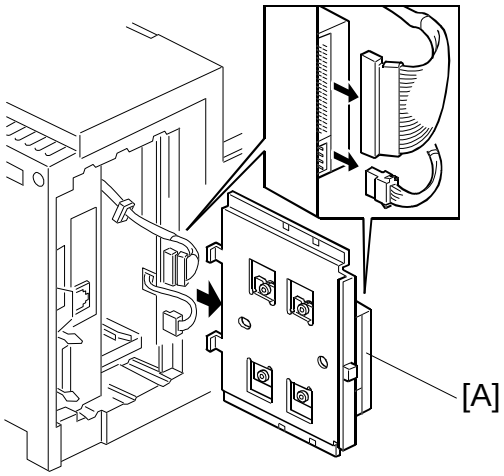
G035R013.WMF



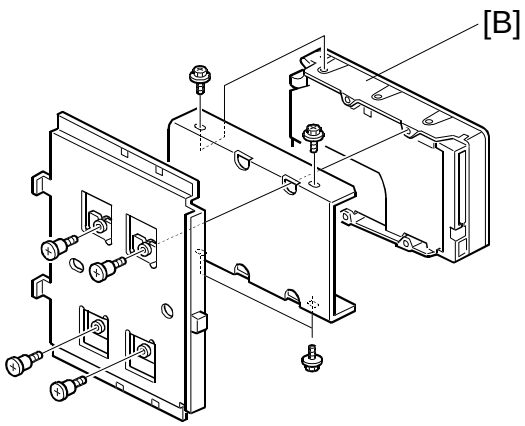
G035R012.WMF

1. Remove the printer controller cover. (See Covers.)
2. Remove the printer controller assembly [A] (2 screws).
3. Remove the optional hard disk unit [B] (4 screws, 1 connector) and DRAM SIMMs that have been installed.
4. Remove the NIB [C] (4 screws, 1 connector).
5. Remove the NVRAM [D] from the old printer control board and install it on the new printer control board.

6.12.4 HARD DISK



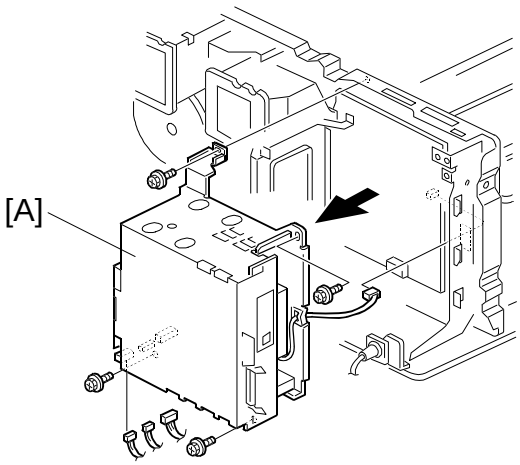
G035R533.WMF



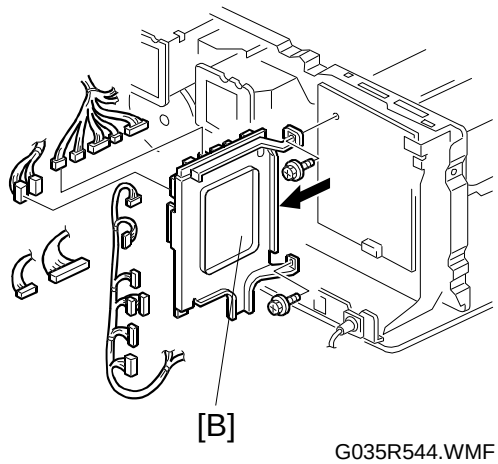
G035R532.WMF

1. Remove the printer controller cover. (See Covers.)
2. Pull the hard disk assembly [A] (2 connectors).
3. Remove the hard disk unit [B] (8 screws).
4. After replacing the HDD, perform SP2-15-2 “Bad Sector Information Reset”.

6.12.5 I/O BOARD



G035R531.WMF

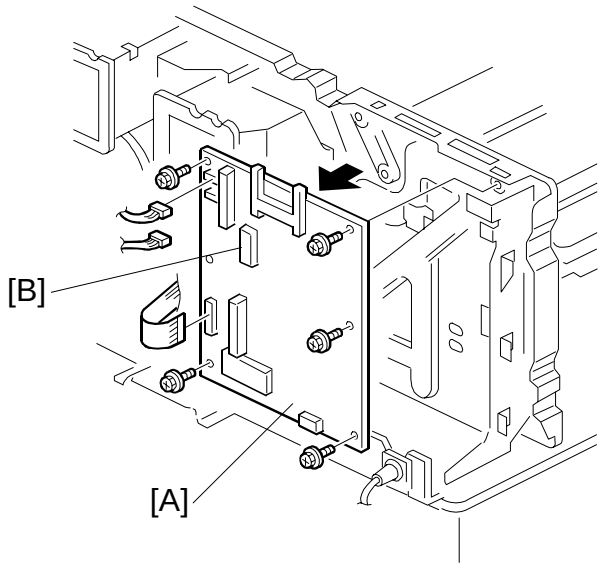


G035R544.WMF

1. Open the front cover.
2. Remove the operation panel cover, connector cover, rear cover, upper cover, printer controller cover and left cover. (See Covers.)
3. Remove the printer controller box [A] (4 screws, 5 connectors).
4. Remove the I/O board bracket [B] (2 screws, all connectors).
5. Remove the I/O board (4 screws).

NOTE: Make sure that the DIP switch settings on the new board are the same as those on the old board.

6.12.6 BICU BOARD



G035R524.WMF

1. Open the front cover.
2. Remove the operation panel cover, connector cover, rear cover, upper cover, printer controller cover and left cover. (See Covers.)
3. Remove the printer controller box. (See I/O Board.)
4. Remove the I/O board bracket. (See I/O Board.)
5. Remove the BICU board [A] (5 screws, 1 stud, all connectors).
6. Remove the NV RAM [B] from the old BICU board and install it on the new board.
7. **For 230 V machines:**
   Download the appropriate language software (not needed for customers using English, German, or French). Then select the correct language with UP mode if necessary (switch the main power off/on after changing this UP mode).

6.13 PRINT IMAGE ADJUSTMENTS

Perform the following adjustments after replacing any of the following part:

- Rollers and gears
- Polygon mirror motor
- Paper side fence
- Memory all clear
- Paper feed unit

For more details about accessing SP modes, refer to section 4.

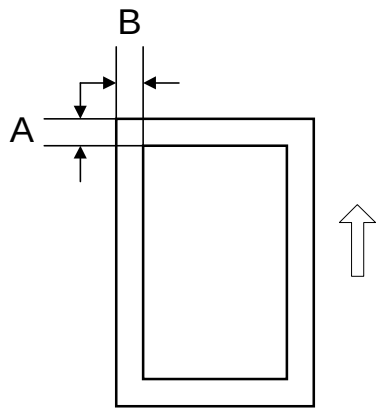
NOTE: 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.
2) Use the Trimming Area Pattern (SP2-12-3, No.10) to print the test pattern for the following procedures.
3) Set SP2-12-3 to 0 again after completing these printing adjustments.

Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration, and adjust it using SP1-1-1.
   The specification is: 3 ± 2mm.
2. Check the side-to-side registration for each paper feed station, and adjust them using the following SP modes.

	SP mode	Specification
1st paper feed	SP2-1-2	2 ± 1.5 mm
2nd paper feed	SP2-1-3	
3rd paper feed (Optional PFU tray 1)	—	
4th paper feed (Optional PFU tray 2)	—	
Duplex	SP2-1-4	
By-pass feed	SP2-1-5	
LCT	SP2-1-6	

NOTE: The default setting (2.0 mm) for the side-to-side registration of the 3rd and 4th paper feeds cannot be changed because the SP mode is unavailable.



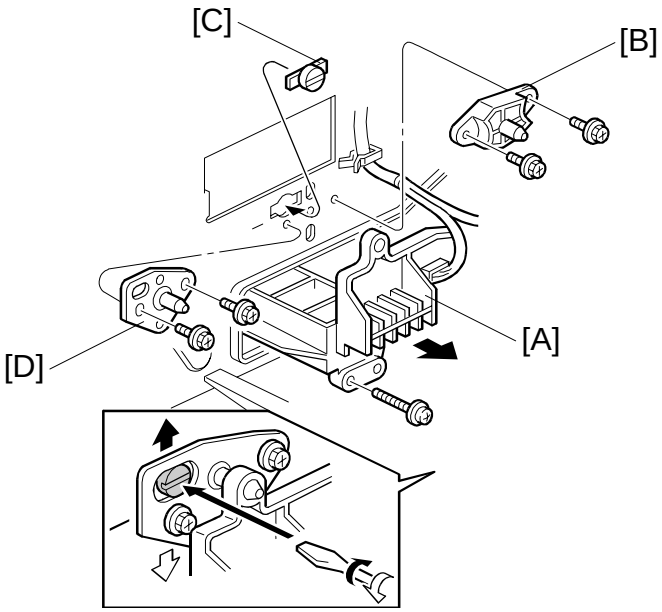
A: Leading Edge Registration
B: Side-to-Side Registration

G035R506.WMF

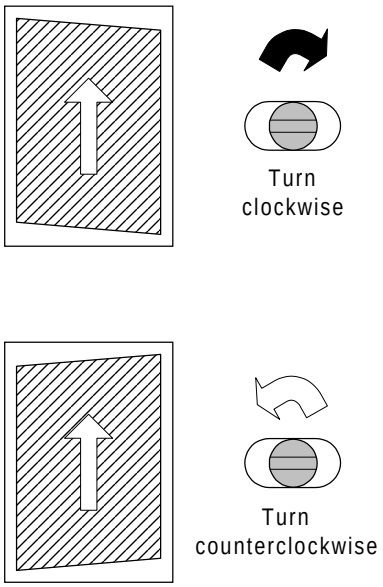
Parallelogram Image Adjustment

Do the following procedure if a parallelogram is printed while adjusting the printing registration using a trimming area pattern.

NOTE: The following procedure should be done after adjusting the side-to-side registration for each paper tray station.



G035R207.WMF



G035R515.WMF

1. Check the trimming area pattern image (SP2-12-1, No.10) whether a parallelogram image appears or not, as shown. If it appears, do the following.
2. Remove the laser unit [A] (see Replacement and Adjustment - Laser Unit).
3. Remove the bracket [B] (2 screws).
4. Install the adjusting cam [C] (P/N: A2309003).
5. Secure the adjustment bracket [D] using the two screws which were used for the bracket [B]. However, do not tighten the screws at this time.
6. Adjusts the laser unit position by turning the adjusting cam. (Refer to the above illustration for the relationship between the image and the cam rotation direction).
7. Tighten the adjustment bracket.
8. Print the trimming area pattern to check the image. If it is still the same, repeat steps 6 to 8.

7. TROUBLESHOOTING

7.1 SERVICE CALL CONDITIONS

7.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The printer cannot be operated at all.	Enter SP mode, then turn the main power switch off and on.
B	Turning the main power switch off and on can reset the SC if the SC was caused by incorrect sensor detection.	Turn the main switch off and on.
C	The printer can be operated as usual except for the unit related to the service call.	Turn the main switch off and on.
D	The SC history is updated. The printer can be operated as usual.	The SC will not be displayed. All that happens is that the SC history is updated.

NOTE: 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
3) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode. This does not apply to Level B' codes.

7.1.2 SC CODE DESCRIPTIONS

SC302: Charge Roller Current Leak

Definition [B]

A charge roller current leak signal is detected.

Possible Causes

- Charge roller damaged
- High voltage supply board defective
- Poor PCU connection

SC304: Charge Roller Current Correction Error

Definition [B]

The charge roller bias correction is performed twice even if the maximum charge roller bias (–2,000 V) is applied to the roller.

Possible Causes

- ID sensor defective

SC320: Polygon Mirror Motor Error

Definition [B]

The polygon mirror motor does not reach its operating speed within 20 seconds after the polygon mirror motor on signal, or the lock signal is still activated for more than 20 seconds after the polygon mirror motor off signal.

Possible Causes

- Polygon mirror motor defective
- Poor connection between the polygon mirror motor driver and the BICU board
- BICU board defective

SC321: No Laser Writing Signal (F-Gate) Error 1

Definition [B]

The laser writing signal (F-gate) does not go to LOW for more than 15 seconds after the paper reaches the registration sensor.

Possible Causes

- BICU board defective
- Poor printer controller connection
- Printer controller defective

SC322: 1st Laser Synchronization Error

Definition [B]

The 1st laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

Possible Causes

- Poor connection between the laser synchronization detector board and the LD unit.
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective

SC323: LD Drive Current Over

Definition [B]

The LD drive board applies more than 110 mA to the LD.

Possible Causes

- LD unit defective (not enough power, due to aging)
- Poor connection between the LD unit and the BICU board
- BICU defective

SC326: 2nd Laser Synchronization Error

Definition [B]

The 2nd laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

Possible Causes

- Poor connection between the laser synchronization detector board and the LD unit.
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective

SC327: LD Unit Home Position Error 1

Definition [B]

The LD unit home position sensor does not detect an on condition when the LD unit moves to its home position.

Possible Causes

- LD unit home position sensor defective
- LD positioning motor defective
- LD unit movement blocked because of incorrect connector routing

SC328: LD Unit Home Position Error 2

Definition [B]

The LD unit home position sensor does not detect an off condition when the LD unit moves from its home position.

Possible Causes

- LD unit home position sensor defective
- LD positioning motor defective
- LD unit movement blocked because of incorrect connector routing

SC329: Laser Beam Pitch Adjustment Error

Definition [B]

The LD unit home position sensor does not detect an on condition while changing the LD unit position for correcting the LD position or changing the dpi.

Possible Causes

- The laser beam pitch adjustment (SP2-6-3 and 4) was not done after replacing the NVRAM or doing an NVRAM clear.
- The laser beam pitch adjustment (SP2-6-1 ~ 4) was not done after replacing the LD unit.
- LD unit movement blocked because of incorrect connector routing

SC350-1: ID Sensor Error 1

Definition [D]

One of the following ID sensor output voltages was detected twice consecutively when checking the ID sensor pattern.

1) Vsp $\geq$ 2.5 V
2) Vsg $\leq$ 2.5 V
3) Vsp = 0 V
4) Vsg = 0 V

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at ID sensor pattern writing area of the drum

SC350-2: ID Sensor Error 2

Definition [D]

The ID sensor output voltage is 5.0 V and the PWM signal input to the ID sensor is 0 when checking the ID sensor pattern.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-3: ID Sensor Error 3

Definition [D]

The ID sensor pattern edge voltage is detected to be not 2.5 V twice consecutively during an 800 ms interval.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-4: ID Sensor Error 4

Definition [D]

One of the following ID sensor output voltages is detected at ID sensor initialization.

1) Vsg < 4.0 V when the maximum PWM input (255) is applied to the ID sensor.
2) Vsg ≥ 4.0 V when the minimum PWM input (0) is applied to the ID sensor.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-5: ID Sensor Error 5

Definition [D]

Vsg falls out of the adjustment target (4.0 ± 0.2 V) during Vsg checking.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC361: Hard Disk Drive Error

Definition [B]

The image data stored in the HDD cannot be output properly.

Possible Causes

NOTE: When this SC occurs only once, this problem will be solved after turning the main switch off and on.

- HDD defective

SC362: IMAC (Image Compression IC) Error

Definition [B]

An error occurs during image processing in the IMAC, which handles image compression and image data transmission.

Possible Causes

- BICU defective

SC365: Image Storage Address Error

Definition [B]

The BICU receives an image data output request signal for data that is not stored in memory.

Possible Causes

- BICU defective

SC390-1: TD Sensor Error 1

Definition [B]

The TD sensor output voltage is less than 0.5 V or more than 4.0 V 10 consecutively during printing.

Possible Causes

- TD sensor abnormal
- Poor connection between the TD sensor and the I/O board (IOB)
- I/O board (IOB) defective

SC390-2: TD Sensor Error 2

Definition [B]

The TD sensor output voltage is less than 1.8 V or more than 4.8 V during TD sensor initial setting.

Possible Causes

- TD sensor abnormal
- No developer in the development unit

SC391: Development Bias Leak

Definition [B]

A development bias leak signal is detected.

Possible Causes

- Poor connection between the development bias terminal and the high voltage supply board
- High voltage supply board defective

SC401: Transfer Roller Error

Definition [B]

The transfer roller current feedback signal is not detected or the transfer roller current leak signal is detected.

Possible Causes

- High voltage supply board defective
- Poor connection between the transfer current terminal and the high voltage supply board
- Poor PCU connection

SC403: Transfer Belt Position Sensor Error

Definition [B]

The transfer belt position sensor does not activate even if the transfer belt clutch has rotated once.

Possible Causes

- Main motor/drive malfunction
- Transfer belt position sensor defective
- Poor transfer belt position sensor connection

SC405: Transfer Belt Error

Definition [B]

The transfer belt does not move away from the drum during ID sensor pattern checking.

Possible Causes

- Main motor/drive malfunction
- Transfer belt position sensor defective
- Poor transfer belt position sensor connection

SC440: Main Motor Lock

Definition [B]

The main motor lock signal is longer than 2 seconds while the main motor turns on.

Possible Causes

- Too much load on the drive mechanism
- Main motor defective

SC490: Exhaust Fan Motor Lock

Definition [B]

An exhaust fan motor lock signal is not detected within 5 seconds after the exhaust fan motor turns on.

Possible Causes

- Too much load on the drive mechanism
- Exhaust fan motor defective
- Poor fan motor connector connection

SC492: Cooling Fan Motor Lock

Definition [B]

A cooling fan motor lock signal is not detected within 5 seconds after the cooling fan motor turns on.

Possible Causes

- Too much load on the drive mechanism
- Cooling fan motor defective
- Poor fan motor connector connection

SC493: Bridge Unit Cooling Fan Lock

Definition [B]

A bridge unit cooling fan motor lock signal is not detected within 5 seconds after the bridge unit cooling fan motor turns on.

Possible Causes

- Too much load on the drive mechanism
- Bridge unit cooling fan motor defective
- Poor fan motor connector connection

SC501-1: 1st Tray Lift Malfunction 1

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

Possible Causes

- 1st tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC501-2: 1st Tray Lift Malfunction 2

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 seconds four times consecutively, this SC will be generated.

Possible Causes

- 1st tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC502-1: 2nd Tray Lift Malfunction 1

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

Possible Causes

- 2nd tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC502-2: 2nd Tray Lift Malfunction 2

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 seconds four times consecutively, this SC will be generated.

Possible Causes

- 2nd tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC503-1: 3rd Tray Lift Malfunction 1 (Optional Paper Tray Unit)

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

Possible causes

- 3rd tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC503-2: 3rd Tray Lift Malfunction 2 (Optional Paper Tray Unit)

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 seconds four times consecutively, this SC will be generated.

Possible Causes

- 3rd tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC504-1: 4th Tray Lift Malfunction 1 (Optional Paper Tray Unit)

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

Possible Causes

- 4th tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC504-2: 4th Tray Lift Malfunction 2 (Optional Paper Tray Unit)

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 seconds four times consecutively, this SC will be generated.

Possible Causes

- 4th tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC506: Paper Tray Unit Main Motor Lock (Optional Paper Tray)

Definition [C]

A main motor lock signal is detected for more than 0.5 s during rotation.

Possible Causes

- Paper tray unit main motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC507: LCT Main Motor Lock (Optional LCT)

Definition [C]

A main motor lock signal is detected for more than 0.5 s during rotation.

Possible Causes

- LCT main motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC510-1: LCT Tray Malfunction 1

Definition [C]

1) The LCT lift sensor does not activate for more than 18 seconds after the LCT lift motor turned on.
2) The LCT lower limit sensor does not activate for more than 18 seconds after the LCT lift motor turned on.
3) The LCT lift sensor is already activated when the LCT lift motor turns on.

Possible Causes

- LCT lift motor defective
- Pick-up solenoid defective
- Poor motor connector connection
- Poor pick-up solenoid connector connection
- Paper end sensor defective
- LCT lift sensor defective
- LCT lower limit sensor defective

SC510-2: LCT Tray Malfunction 2

Definition [C]

1) During paper lifting, the LCT lift sensor does not activate for more than 1.5 seconds after the paper end sensor turned on. If this condition occurs four times consecutively, this SC will be generated.
2) During paper lifting, after the top of the paper reaches the upper limit position, the paper is lowered until the LCT lift sensor is de-activated. At this time, the LCT lift sensor does not de-activate for more than 5 seconds.

Possible Causes

- LCT lift motor defective
- Pick-up solenoid defective
- Poor motor connector connection
- Poor pick-up solenoid connector connection
- Paper end sensor defective
- LCT lift sensor defective
- LCT lower limit sensor defective

SC541: Fusing Thermistor Open

Definition [A]

The fusing temperature detected by the thermistor was below 7°C for 16 seconds.

Possible Causes

- Fusing thermistor defective or out of position
- Poor thermistor terminal connection

SC542: Fusing Temperature Warming-up Error

Definition [A]

The fusing temperature does not reach the fusing standby temperature within 145 seconds after the main power switch is turned on.

Possible Causes

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- BICU defective
- Power supply board defective
- Poor fusing unit connection

SC543: Fusing Overheat Error 1

Definition [A]

A fusing temperature of over 231°C is detected for 5 seconds by the fusing thermistor.

Possible Causes

- Fusing thermistor defective
- BICU defective
- I/O board (IOB) defective

SC545: Fusing Overheat Error 2

Definition [A]

The fusing lamp stays on at full power for 30 seconds while in the stand-by condition after warming-up is completed.

Possible Causes

- Fusing thermistor out of position

SC546: Fusing Ready Temperature Malfunction

Definition [A]

The fusing temperature goes 20°C below or 20°C over the stand-by temperature after warm-up is completed.

Possible Causes

- Poor thermistor connector connection
- Poor fusing unit connection

SC547: Zero Cross Signal Malfunction

Definition [A]

Zero cross signals are not detected within a certain period within 500 ms after the main power switch has been turned on.

Possible Causes

- Power supply board defective
- Noise on the ac power line

SC548: Fusing Unit Installation Error

Definition [A]

The machine cannot detect the fusing unit when the front cover and right cover are closed.

Possible Causes

- Fusing unit is not installed
- Poor fusing unit connection

SC602: Communication Error between BICU and HDD Controller

Definition [B]

The BICU cannot communicate with the HDD controller.

Possible Causes

- Poor connection between the BICU board and HDD controller
- HDD controller defective
- BICU board defective

SC621: Communication Error between BICU and Finisher

Definition [B]

The BICU cannot communicate with the finisher properly.

Possible Causes

- Poor connection between the BICU board and the finisher main board
- Finisher main board defective
- BICU board defective

SC623: Communication Error between BICU and Paper Tray Unit

Definition [B]

The BICU cannot communicate with the paper tray unit properly.

Possible Causes

- Poor connection between the BICU board and the paper tray unit main board
- Paper tray unit main board defective
- BICU board defective

SC624: Communication Error between BICU and LCT

Definition [B]

The BICU cannot communicate with the LCT properly.

Possible Causes

- Poor connection between the BICU board and the LCT main board
- LCT main board defective
- BICU board defective

SC722: Finisher Jogger Motor Error

Definition [B]

1) The finisher jogger H.P sensor remains de-activated for more than a certain time when returning to home position.
2) The finisher jogger H.P sensor remains activated for more than a certain time when moving away from home position.

Possible Causes

- Jogger H.P sensor defective
- Jogger motor defective

SC724: Finisher Staple Hammer Motor Error

Definition [B]

Stapling does not finish within a certain time after the staple hammer motor turned on.

Possible Causes

- Staple hammer motor defective
- Staple jam

SC725: Finisher Stack Feed-out Motor Error

Definition [B]

The stack feed-out belt H.P sensor does not activate within a certain time after the stack feed-out motor turned on.

Possible Causes

- Stack feed-out H.P sensor defective
- Stack feed-out motor defective

SC726: Finisher Shift/Lift Motor Error

Definition [B]

1) Tray shift does not finish within a certain time after the shift motor turned on.
2) The stack height sensor does not activate within a certain time after the shift tray lift motor turned on.

Possible Causes

- Shift motor defective
- Shift tray lift motor defective

SC727: Finisher Stapler Rotation Motor Error

Definition [B]

1) Stapler rotation does not finish within a certain time after the staple rotation motor turned on.
2) The stapler does not return to its home position within a certain time after stapling finished.

Possible Causes

- Stapler rotation motor defective
- Poor stapler rotation motor connection

SC729: Finisher Punch Motor Error

Definition [B]

The punch H.P sensor does not activate within a certain time after the punch motor turned on.

Possible Causes

- Punch motor defective
- Punch H.P sensor defective
- Poor punch motor connection

SC730: Finisher Stapler Position Motor Error

Definition [B]

1) The stapler home position sensor stays on for longer than normal when the stapler motor turns on to return the stapler to its home position.
2) The stapler H.P sensor does not turn on within a certain time after the stapler motor turned on to move the stapler away from home position.

Possible Causes

- Stapler motor defective
- Stapler H.P sensor defective
- Poor stapler motor connection

SC900: Electrical Total Counter Error

Definition [A]

The total counter contains a character that is not a number.

Possible Causes

- NVRAM defective

SC951: F-Gate Signal Error 2

Definition [B]

When the IPU has already received the F-gate signal, the IPU receives another F-gate signal.

Possible Causes

- BICU defective

SC954: Printer Image Setting Error

Definition [B]

The settings that are required for image processing using the printer controller are not sent from the IPU.

Possible Causes

- Software defective

SC955: Memory Setting Error

Definition [B]

The settings that are required for image processing using the memory are not sent from the IPU.

Possible Causes

- Software defective

SC959: Printer Setting ID Error

Definition [B]

The ID that is required for image processing using the printer is not sent from the IPU.

Possible Causes

- Software defective

SC960: Printer Return ID Error

Definition [B]

The ID that is sent from the printer controller after finishing the printout is incorrect.

Possible Causes

- Software defective

SC961: Printer Ready ID Error

Definition [B]

The ID that is sent from the printer controller in the printer controller printing ready condition is incorrect.

Possible Causes

- Software defective

SC962: Memory Setting ID Error

Definition [B]

The ID that is sent from the memory when the IPU sent the memory ready signal is incorrect.

Possible Causes

- Software defective

SC963: Memory Finishing ID Error

Definition [B]

The ID that is sent from the memory when the IPU sent the memory finish signal is incorrect.

Possible Causes

- Software defective

SC964: Printer ready error

Definition [B]

The print ready signal is not generated for more than 17 seconds after the IPU received the print start signal.

Possible Causes

- Software defective

SC980: HDD Access Error

Definition [B]

Incorrect parameter sent to the HDD controller.

Possible Causes

- Software defective
- Poor connection between BICU and HDD.

SC981: HDD Response Error

Definition [B]

The HDD controller board does not generate any response when the IPU sends a read/write signal to the HDD controller.

Possible Causes

- Software defective
- Poor connection between BICU and MSU
- HDD defective

SC982: HDD Construction Error

Definition [B]

1) The HDD has been installed without the electric sort kit (SIMM memory).
2) A HDD that does not have the correct specifications has been installed.

Possible Causes

- Hard disk defective
- Incorrect hard disk type
- The electric sort kit is not installed

SC990: Software Performance Error

Definition [B]

The software performs an unexpected function.

Possible Causes

- Software defective

NOTE: 1) When this SC occurs, the file name, address, and data will be stored in the NVRAM. These data can be checked by SMC printing-logging data (SP2-22-3).
2) Note the above data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.

7.1.3 PRINTER CONTROLLER

Error Messages

If an error occurred, the error LED lights and an error message is displayed on the LCD.

Service Call (SC) Codes

SC No.	Description/Definition	Possible Cause
SC2000	Functional problems (Self diagnostic error)	Printer controller defective.
	A diagnostic error occurred at power on. The printer controller has a hardware problem.	
SC2001	Functional problems (Debug trap error)	The controller software has a problem.
	An error has occurred in the printer controller. The controller has a software problem.	
SC2002	Functional problems (Exception error)	Printer controller defective.
	An error has occurred in the controller. The controller has a software or hardware problem.	

Other Messages

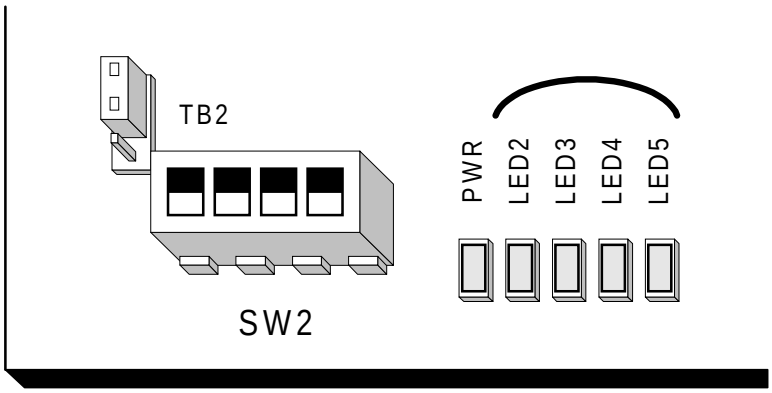
The following errors might need assistance from service.

Error Message	Condition	Possible Cause
Printer HDD Error.	A hard disk error was detected during downloading the macro or fonts.	• Printer HDD defective • Printer controller defective
Parallel Communication Error.	Parallel communication error occurred during a print job via the parallel port.	• An item in the parallel menu was set incorrectly • Parallel cable defective • Printer controller defective
Print Over Run.	This error occurred when a file was being printed in banding mode. A complex page may not have enough time to image a band while the engine is printing the previous page.	• Insufficient memory • A complex page is printed • The DRAM SIMM board is defective • The controller is defective
Memory Overflow.	This error occurred during printing. The language has sent a file that is too complex to interpret in the available memory.	• Insufficient memory • A complex page is printed • The DRAM SIMM is board defective • The controller is defective

LEDs

Location

Four LEDs (LED2 to LED5) are located near SW2 on the printer controller. They indicate display the progress of the self test, and errors and status conditions.



G035T500.WMF

LED Code Table

Self Diagnostic

The following LED table is for the self diagnostic function. When an error occurs during the self diagnostic test, all four LEDs blink then indicate the error as shown in the following table.

e.g.) RAM error:

All LEDs on (1 s) → off (1 s) → on (1 s) → off (1 s) → LED4 on (5 s) → from the beginning.

1 = LED is lit, 0 = LED is off

LEDs				Description
LED2	LED3	LED4	LED5	
0	0	0	1	ROM error
0	0	1	0	RAM (resident, SIMM) error: NOTE 1)
0	0	1	1	NVRAM error: NOTE 1)
0	1	0	1	Fatal error
0	1	1	0	Debug trap error: NOTE 2)

NOTE: 1) SC2000 is also displayed.
2) SC2002 is also displayed.

Trouble-shooting

Controller Firmware Copy/Download

During controller firmware copying and downloading, the following LED status will be indicated.

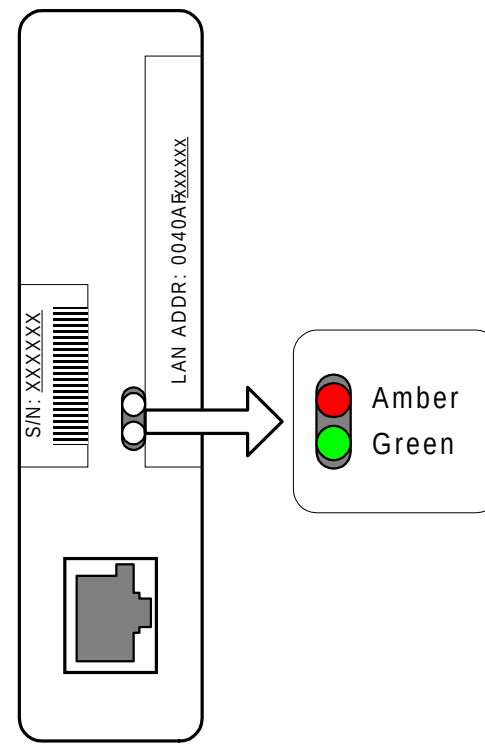
1 = LED is lit, 0 = LED is off, 1/0 = LED is blinking

LEDs				Description
LED2	LED3	LED4	LED5	
1	0	0	0	Data downloading
0	1/0	0	0	Erasing
1/0	1/0	1	0	Programming
0	0	0	1	Verifying
1	0	0	1	Insufficient RAM error
1	0	1	0	Verify failure
1	0	1	1	Download failure (check sum error)
1	1	0	0	Erase failure
1	1	0	1	Download failure (other error)
1	1	1	1	Copy/download success

7.1.4 NETWORK INTERFACE BOARD

LED Indications

Two LEDs visible from the outside, one amber and one green, indicate the status of the network interface board (NIB). Refer to the diagram on the right for their location.



G035T501.WMF

Amber (upper)	Green (lower)	Status	Condition(s)
Blinks	On	Normal	• The NIB is receiving a packet from the Ethernet.
—	On	Normal	• The machine has just been turned on. The NIB then initializes itself. • The NIB is waiting for a print job.
—	Blinks 3 times, then stays on	Normal	• The NIB has finished initialization, and will print a status sheet.
—	Blinks rapidly	Initialization Error	• The NIB detected a bad RAM chip during initialization. • Turn the machine off and on. If the NIB detects the same error again, replace the NIB.
Blinks for 10 s, then goes off	Blinks	Initialization Error	• The NIB detected a data error in the flash ROM (firmware) during initialization. • Recover the firmware by downloading it through the network.
—	Blinks rapidly 4 times, then off	Error	• The NIB detected an Ethernet hardware error. • Check the Ethernet connections and restart the machine. If the error is frequent, try replacing the NIB.
—	Blinks rapidly	Error	• The NIB has lost connection to NetWare file server(s). • Check the cable connection and the NetWare server status.
Blink alternately		NVRAM reset	• The NIB has reset its NVRAM to the factory defaults. (Refer to section 4.5.1 for how to reset the NVRAM.)

7.2 ELECTRICAL COMPONENT DEFECTS

7.2.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
LD Unit Home Position (S1)	220-2 (IOB)	Open	SC328 is displayed when the laser beam pitch is changed.
		Shorted	SC327 is displayed when the laser beam pitch is changed.
Toner Density (TD) (S2)	204-3 (IOB)	Open	The add toner indicator blinks even if there is toner in the development unit.
		Shorted	SC390-1 is displayed.
Paper Exit (S3)	203-B2 (IOB)	Open	The Paper Jam indicator will light whenever a printed sheet is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration (S4)	207-B2 (IOB)	Open	The Paper Jam indicator lights even if there is no paper.
		Shorted	The Paper Jam indicator will light whenever a printed sheet is made.
Image Density (ID) (S5)	219-5 (IOB)	Open	SC350-3 is displayed after printing.
		Shorted	SC350-1 is displayed after printing.
Upper Paper Lift (S6)	235-2 (PFB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC501-2 will be displayed.
		Shorted	SC501-1 is displayed.
Lower Paper Lift (S7)	236-2 (PFB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC502-2 will be displayed.
		Shorted	SC502-1 is displayed.
Upper Paper End (S8)	235-8 (PFB)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.
Lower Paper End (S9)	236-8 (PFB)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
Upper Relay (S10)	235-5 (PFB)	Open	The Paper Jam indicator will light whenever a printed sheet is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Relay (S11)	236-5 (PFB)	Open	The Paper Jam indicator will light whenever a printed sheet is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Transfer Belt Position (S12)	203-A8 (IOB)	Open	No symptom
		Shorted	SC403 is displayed

7.2.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Right Lower Cover (SW1)	232-3 (PFB)	Open	Doors/Covers Open is displayed even if the right lower cover is closed.
		Shorted	The LCD goes blank when the lower cover is opened.
Main (SW3)	102-1~4 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety (SW4)	219-11 (IOB)	Open	Doors/Covers Open is displayed even if the front cover is closed.
		Shorted	Doors/Covers Open is not displayed even if the front cover is opened.

7.3 BLOWN FUSE CONDITIONS

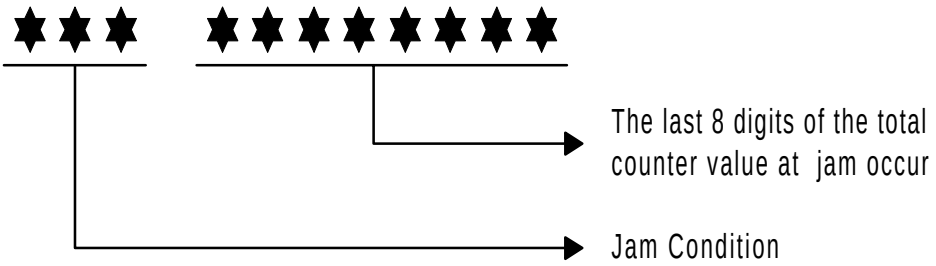
Fuse	Rating		Symptom when turning on the main power switch
	115 V	210 ~ 230 V	
Power Supply Board			
FU1	6.3 A/125 V	6.3 A/250 V	“Doors/Covers Open” is displayed
FU2	6.3 A/125 V	6.3 A/250 V	“Doors/Covers Open” for the finisher is displayed
FU3	4 A/125 V	4 A/250 V	Paper end condition
FU5	6.3 A/125 V	6.3 A/250 V	One of SC302, or SC403, or SC405 is displayed
FU101	15 A/125 V	—	No response
FU102	8 A/125 V	5 A/250 V	No response

APPENDIX

APPENDIX 1

1.1 JAM HISTORY

The jam history is read in this way.



G035X500.WMF

1.1.1 JAM CONDITION TABLE

Code	Condition
001	Jams at power on
003	1st paper tray : paper non-feed jam
004	2nd paper tray : paper non-feed jam
005	3rd paper tray: paper non-feed jam
006	4th paper tray: paper non-feed jam
007	LCT: Paper non-feed jam
008	Upper relay sensor: paper does not activate the sensor
009	Lower relay sensor: paper does not activate the sensor
00A	Upper relay sensor - op. PTU: paper does not activate the sensor
013	Registration sensor: paper does not activate the sensor
016	Exit sensor: paper does not activate the sensor
017	Bridge exit sensor: paper does not activate the sensor
018	Bridge relay sensor: paper does not activate the sensor
019	Duplex entrance sensor: paper does not activate the sensor
023	Duplex exit sensor: paper does not activate the sensor
025	Fusing entrance sensor: paper does not activate the sensor
026	3,000-sheet finisher upper tray exit sensor: paper does not activate the sensor
027	Finisher shift tray exit sensor: paper does not activate the sensor
028	Staple tray paper sensor: paper does not activate the sensor
029	Finisher stack feed-out belt HP sensor: paper does not activate the sensor
030	Mail box entrance sensor: paper does not activate the sensor
031	Mail box proof tray exit sensor: paper does not activate the sensor
032	Mail box relay sensor: paper does not activate the sensor
033	Mail box sensor: paper does not activate the sensor
057	LCT: paper doe not activate the sensor
058	1st paper tray: paper stays at the sensor
059	2nd paper tray: paper stays at the sensor

Code	Condition
060	3rd paper tray: paper stays at the sensor
061	4th paper tray: paper stays at the sensor
063	Registration sensor: paper stays at the sensor
066	Exit sensor: paper stays at the sensor
067	Bridge exit sensor: paper stays at the sensor
068	Bridge relay sensor: paper stays at the sensor
069	Duplex entrance sensor: paper stays at the sensor
073	Registration sensor: paper stays at the sensor

G035 Point to Point Diagram

Signal Table

———	AC Line
———	PC Line
- - - -	Pulse
◄——►	Signal Direction
< >	Signal Direction
▲	Active High
▼	Active Low
[ ]	Voltage

BICU (PCB4)

Mother Board (PCB2)

Controller Board (PCB1)

PSU (PCB8)

IOB (PCB5)

Main Board (PCB10)

Duplex

Operation Panel

Bridge Unit (Option)

Paper Feed Control (PCB6)

By-pass

CN303 (BICU) for CN401 (LDB)					
1		GND			
2		XPOR	>		
3		GND			
4		SIN	>		
5		GND			
6	<	VDSDI			
7		GND			
8		SCLK	>		
9		GND			
10		XCS	>		
11		GND			
12		REFCLK	>		
13		GND			
14		XDE3	>		
15		GND			
16		XDE2	>		
17		GND			
18		XDE1	>		
19		GND			
20		XDE0	>		
21		GND			
22		XDO3	>		
23		GND			
24		XDO2	>		
25		GND			
26		XDO1	>		
27		GND			
28		XDO0	>		
29		GND			
30		SE	>		
31		GND			
32		SO	>		
33		GND			
34		XFGATE			
35		GND			
36		XLGATE			
37		GND			
38		XLSYNC			
39		GND			
40		PCLK			
41		GND			
42		XLDSYNC			
43		GND			
44		LDOFFIN			
45		GND			
46		LDERRO			
47		GND			
48		DROPEN			
49		LDOFF2			
50		LDOFF1			

CN304 (BICU) for CN350 (MB)					
1		GND	31	<	XRTRG
2	<	XDATA_IN	32		GND
3		XOEN	33	<	XARKD7
4	<	XARKD6	34	<	XARKD5
5	<	XARKD4	35	<	XARKD3
6	<	XARKD2	36	<	XARKD1
7	<	XARKD0	37		GND
8		XFSYNC	> 38		XWRSYNC >
9	<	XARFGT	39	<	XARLSYC
10	<	XARLGT	40		GND
11	<	XARCLK	41		GND
12		XAWKD7	> 42		XAWKD6 >
13		XAWKD5	> 43		XAWKD4 >
14		XAWKD3	> 44		XAWKD2 >
15		XAWKD1	> 45		XAWKD0 >
16	<	XTRG	46	<	XPOSE_M
17		GND	47		XAWFGT >
18		XAWLSYC	> 48		XAWLGT >
19		GND	49		XAWCLK >
20		GND	50	<	RXD1
21		TXD1	> 51	<	XCTS1
22		RXRDY1	> 52	<	EX_FCU
23		XSW_ON	> 53		GND
24		GND	54	<	RCVDT4
25		TXD4	> 55		GND
26	<	RCVDT3	56		TXD3 >
27		GND	57	<	RCVDT2
28		TXD2	> 58		XOE_A1 >
29		XOE_A0	> 59		GND
30	<	RINGING	60		GND

CN313 for HDD			
1		X_RST-HDD	
2		GND	>
3		HDT	
4		HDT	
5		HDT	
6		HDT	
7		HDT	
8		HDT	
9		HDT	
10		HDT	
11		HDT	
12		HDT	
13		HDT	
14		HDT	
15		HDT	
16		HDT	
17		HDT	
18		HDT	
19		GND	
20		GND	
21	<	DMRQ	
22		GND	
23		XDIORW	
24		GND	>
25		XDIOR	
26		GND	>
27	<	IORDY	
28		N.C.	
29		XDMACK	
30		GND	>
31	<	INTRQ	
32	<	XIOCS16	
33		ADDR 1	
34		N.C.	
35		ADDR 0	
36		ADDR 2	>
37		XCS1FX	>
38		XCS3FX	>
39		N.C.	>
40		GND	

CN308 for IC Card					
1		GND	35		GND >
2		D3	36		XCD1 >
3	<	D4	> 37		D11 >
4	<	D5	> 38		D12 >
5	<	D6	> 39		D13 >
6	<	D7	> 40		D14
7	<	GND	> 41		D15 >
8	<	A10	> 42		GND
9	<	XOECRD	> 43	<	N.C.
10	<	A11	> 44	<	N.C.
11		A9	> 45	<	N.C.
12		A8	> 46	<	A17
13		A13	> 47	<	A18
14		A14	> 48	<	A19
15		XWECRD	> 49		A20
16		N.C.	50		N.C.
17		+5VE	> 51		+5VE
18		N.C.	52		N.C.
19		A16	> 53		N.C.
20		A15	> 54		N.C.
21		A12	> 55		N.C.
22		A7	> 56		N.C.
23	<	A6	57		N.C.
24	<	A5	58		N.C.
25	<	A4	> 59		N.C.
26	<	A3	60		N.C.
27	<	A2	61		N.C.
28		A1	62		N.C.
29		A0	> 63		N.C.
30		D0	64	<	D8
31	<	D1	65	<	D9
32		D2	> 66	<	D10
33		NC	67	<	XCD2
34		GND	> 68		GND

CN4 for IEEE1284			
1	PP_STROBE	19	GND
2	PP_D0	20	GND
3	PP_D1	21	GND
4	PP_D2	22	GND
5	PP_D3	23	GND
6	PP_D4	24	GND
7	PP_D5	25	GND
8	PP_D6	26	GND
9	PP_D7	27	GND
10	PP_ACK	28	GND
11	PP_BUSY	29	GND
12	PP_PERROR	30	GND
13	PP_SELECT	31	PP_INT
14	PP_AUTOFD	32	PP_FAULT
15	N.C.	33	N.C.
16	GND	34	N.C.
17	GND	35	N.C.
18	PLH+5V	36	PP_SELCTI

CN14 for PCMCIA (IC Card)					
1		GND	35		GND
2		IO_D3	36		PCM_-CD1
3		IO_D4	37		IO_D11
4		IO_D5	38		IO_D12
5		IO_D6	39		IO_D13
6		IO_D7	40		IO_D14
7		PCM_-CS	41		IO_D15
8		IO_A11	42		PCM_-CS
9		PCM_-RD	43		N.C.
10		IO_A12	44		N.C.
11		IO_A10	45		N.C.
12		IO_A9	46		IO_A18
13		IO_A14	47		IO_A19
14		IO_A15	48		IO_A20
15		PCM_-WR	49		IO_A21
16		N.C	50		IO_A22
17		+5V	51		+5V
18		+5V	52		+5V
19		IO_A17	53		IO_A23
20		IO_A16	54		N.C.
21		IO_A13	55		N.C.
22		IO_A8	56		N.C.
23		IO_A7	57		N.C.
24		IO_A6	58		PCM_RESET
25		IO_A5	59		N.C.
26		IO_A4	60		N.C.
27		IO_A3	61		PCM_-REG
28		IO_A2	62		N.C.
29		GND	63		N.C.
30		IO_D0	64		IO_D8
31		IO_D1	65		IO_D9
32		IO_D2	66		IO_D10
33		N.C	67		PCM_-CD2
34		GND	68		GND

CN3 for NIB		
A1		+5V
A2		PSIO_INT
A3		PSIO_RESET
A4		IO_WR
A5		IO_CS0
A6		PSIO_PR
A7		GND
A8		IO_D0
A9		IO_D2
A10		IO_D4
A11		IO_D6
A12		IO_D8
A13		IO_D10
A14		IO_D12
A15		IO_D14
A16		GND
A17		IO_A2
A18		IO_A4
A19		IO_A6
A20		IO_A8
A21		IO_A10
A22		IO_A12
A23		IO_A14
A24		IO_A16
A25		+5V
B1		GND
B2		PSIO_WAIT
B3		PSIO_WR
B4		PSIO_RD
B5		IO_A23
B6		(reserved)
B7		GND1
B8		IO_D3
B9		IO_D5
B10		IO_D7
B11		IO_D9
B12		IO_D11
B13		IO_D13
B14		IO_D15
B15		IO_D
B16		GND
B17		IO_A3
B18		IO_A5
B19		IO_A7
B20		IO_A9
B21		IO_A11
B22		IO_A13
B23		IO_A15
B24		IO_A17
B25		GND

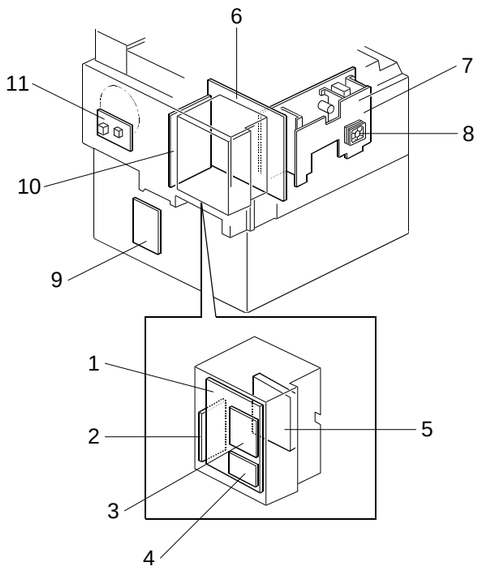
CN2 for HDD			
1		IO_RESET	
2		GND	
3		IO_D7	
4		IO_D8	
5		IO_D6	
6		IO_D9	
7		IO_D5	
8		IO_D10	
9		IO_D4	
10		IO_D11	
11		IO_D3	
12		IO_D12	
13		IO_D2	
14		XWRRGT	
15		GND	
16		XARCLK	
17		XARKD7	
18		XARKD5	
19		XARKD3	
20		XARKD1	
21		N.C.	
22		GND	
23		IO_WR	
24		GND	
25		IO_RD	
26		GND	
27		N.C.	
28		GND	
29		GND	
30		GND	
31		XLED4	
32		XLED2	
33		XSW1	
34		XSW3	
35		XSW5	
36		XSW7	
37		LCDXD3	
38		LCDXD1	
39		LCDXE	
40		+5V	

CN1 for CN352 (BICU)			
1	GND	41	GND
2	TXD2	42	XRXD2
3	N.C.	43	N.C.
4	N.C.	44	N.C.
5	XDATA_IN	45	N.C.
6	N.C.	46	N.C.
7	N.C.	47	N.C.
8	N.C.	48	N.C.
9	N.C.	49	N.C.
10	N.C.	50	N.C.
11	N.C.	51	N.C.
12	XOE2	52	N.C.
13	N.C.	53	N.C.
14	XWRRGT	54	XARLSYC
15	GND	55	LARLGT
16	XARCLK	56	GND
17	XARKD7	57	XARKD6
18	XARKD5	58	XARKD4
19	XARKD3	59	XARKD2
20	XARKD1	60	XARKD0
21	N.C.	61	N.C.
22	GND	62	N.C.
23	N.C.	63	GND
24	XWRSYNC	64	XSYNC
25	+5V	65	+5V
26	+5V	66	+5V
27	N.C.	67	+5V
28	GND	68	GND
29	GND	69	GND
30	GND	70	GND
31	XLED4	71	XLED3
32	XLED2	72	XLED1
33	XSW1	73	XSW2
34	XSW3	74	XSW4
35	XSW5	75	XSW6
36	XSW7	76	XSW8
37	LCDXD3	77	LCDXD2
38	LCDXD1	78	LCDXD0
39	LCDXE	79	LCDRS
40	+5V	80	GND

MB-CN352 or PRINTER			
A1		GND	
A2	<	XARKD 6	
A3	<	XARKD 4	
A4	<	XARKD 2	
A5	<	XARKD 0	
A6		GND	
A7		XFSYNC	>
A8		XWRSYNC	>
A9	<	XARFGT	
A10	<	XARLSYC	
A11	<	XARLGT	
A12		GND	
A13	<	XARCLK	
A14		GND	
A15		N.C.	
A16		N.C.	
A17		N.C.	
A18		N.C.	
A19		GND	
A20		-	
A21		N.C.	
A22		N.C.	
A23		N.C.	
A24		GND	
A25		N.C.	
A26		GND	
A27		TXD 2	>
A28		GND	
A29	<	RXD_F	
A30		+5VE	
A31		+5VE	
A32		+5VE	
B1		GND	
B2	<	XARKD 7	
B3	<	XARKD 5	
B4	<	XARKD 3	
B5	<	XARKD 1	
B6		GND	
B7		XOE 2	>
B8	<	XCTS_F	
B9		GND	
B10		RXRDY_F	>
B11			
B12		GND	
B13		GND	
B14		GND	
B15		N.C.	
B16		N.C.	
B17		N.C.	
B18		N.C.	
B19		GND	
B20			
B21		GND	
B22		GND	
B23		GND	
B24		GND	
B25		GND	
B26		GND	
B27	<	RXD 2	
B28		GND	
B29		TXD_F	>
B30		+5VE	
B31		+5VE	
B32		+5VE	

CN208(IOB) for CN233(PFD)			
A1		N.C.	
A2	<	/Upper Paper Size: 4	
A3	<	/Upper Paper Size: 3	
A4	<	/Upper Paper Size: 2	
A5	<	/Upper Paper Size: 1	
A6	<	Upper Paper Amount: 2	
A7	<	Upper Paper Amount: 1	
A8	<	/Upper Paper Height	
A9	<	Upper Relay	
A10	<	Upper Paper End	
A11	<	/Upper Paper Feed CL.	>
A12		/Upper Tray Lift Motor: Down	>
A13	<	/Upper Tray Lift Motor: Up	>
A14		N.C.	
A15		N.C.	
A16		N.C.	
A17		N.C.	
A18		Paper Tray Unit: GND	
A19	<	Paper Tray Unit: RXD	
A20		Paper Tray Unit: GND	
A21		Paper Tray Unit: TXD	>
A22		LCT: GND	
A23		LCT: RXD	
A24		LCT: GND	
A25		LCT: TXD	>
B1		NC	
B2	<	/Lower Paper Size: 4	
B3	<	/Lower Paper Size: 3	
B4	<	/Lower Paper Size: 2	
B5	<	/Lower Paper Size: 1	
B6	<	Lower Paper Amount: 2	
B7	<	Lower Paper Amount: 1	
B8	<	Lower Paper Height	
B9	<	/Lower Relay	
B10	<	Lower Paper End	
B11		/Lower Paper Feed CL.	>
B12		/Lower Tray Lift Motor: Down	>
B13		/Lower Tray Lift Motor: Up	>
B14		/Relay CL.	>
B15	<	Right Lower Cover Sw.	
B16		/By-pass Paper Feed CL.	>
B17		/By-pass Pick-up Sol.	>
B18	<	By-pass Paper End	
B19		-	
B20	<	/By-pass Paper Size: Bit 0	
B21	<	/By-pass Paper Size: Bit 1	
B22	<	/By-pass Paper Size: Bit 2	
B23	<	/By-pass Paper Size: Bit 3	
B24	<	/By-pass Tray Set	
B25		N.C.	

PRINTER (G035) ELECTRICAL COMPONENT LAYOUT



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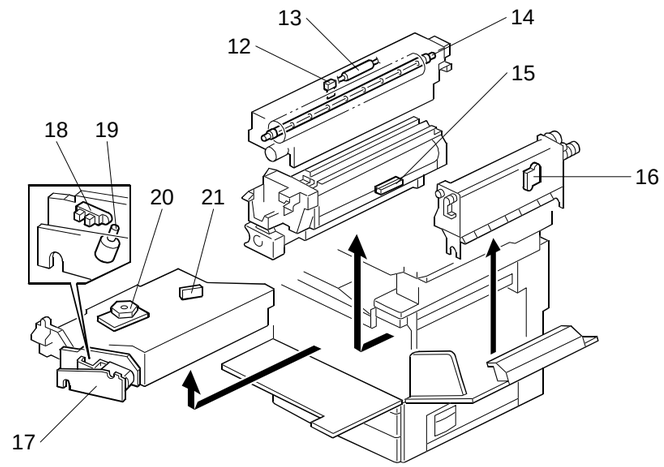

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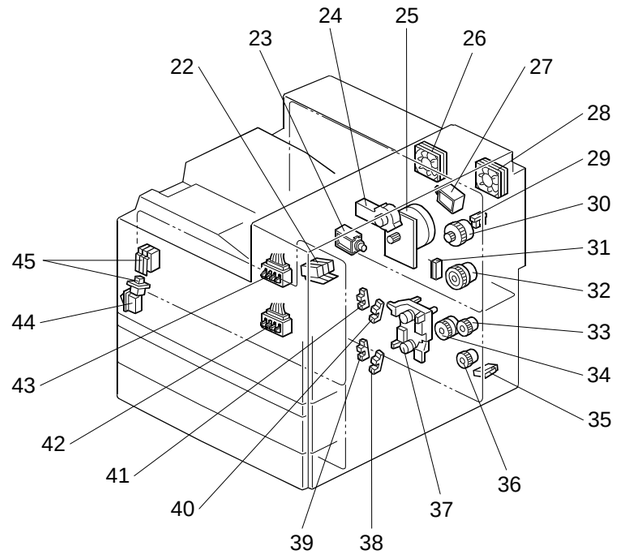

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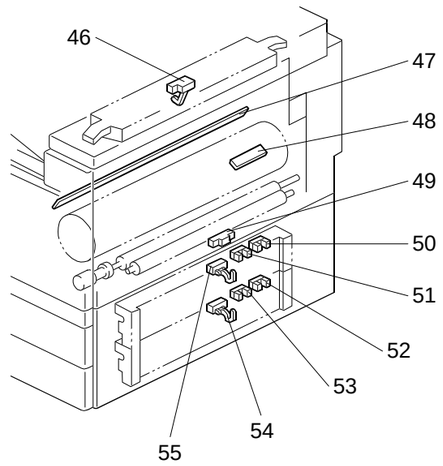
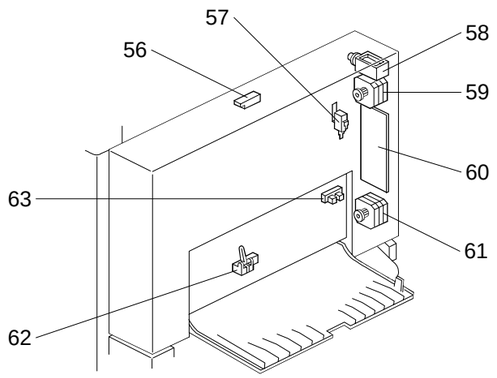


G035S013.WMF

Symbol	Index No.	Description	P to P
Printed Circuit Boards			
PCB1	1	Printer Controller Board	I10
PCB2	2	Mother Board	F10
PCB3	3	Network Interface Board	L10
PCB4	6	BICU (Base Engine & Image Control Unit)	C9
PCB5	10	IOB (Input/Output Board)	G3
PCB6	9	PFB (Paper Feed Control Board)	O6
PCB7	11	High Voltage Supply	K5
PCB8	7	PSU (Power Supply Unit)	K6
PCB9	17	LDDR (Laser Diode Driver)	B12
PCB10	60	Main (Duplex Unit)	F5
Motors			
M1	25	Main	I5
M2	37	Tray Lift	Q5
M3	20	Polygonal Mirror	A10
M4	19	LD Positioning	I1
M5	26	Cooling Fan	J1
M6	28	Exhaust Fan	B1
M7	24	Toner Supply	H2
M8	8	PSU Cooling Fan	F2
M9	59	Inverter	E5
M10	61	Transport	F5
Sensors			
S1	18	LD Unit Home Position	I1
S2	15	Toner Density (TD)	A1
S3	46	Paper Exit	K1
S4	49	Registration	J5
S5	48	Image Density (ID)	G1
S6	50	Upper Paper Lift	Q8
S7	52	Lower Paper Lift	Q7
S8	51	Upper Paper End	Q8
S9	53	Lower Paper End	Q7
S10	55	Upper Relay	Q8
S11	54	Lower Relay	Q7

Symbol	Index No.	Description	P to P
S12	29	Transfer Belt Position	J1
S13	16	Toner Overflow	J5
S14	41	Upper Paper Height 1	Q10
S15	40	Upper Paper Height 2	Q10
S16	39	Lower Paper Height 1	Q9
S17	38	Lower Paper Height 2	Q9
S18	31	New Unit Detection	F1
S19	54	Entrance	F5
S20	62	Exit	F5
S21	63	Cover Guide	F5
S22	64	Paper End	Q5
S23	67	Paper Size	Q6
Switches			
SW1	35	Right Lower Cover	Q10
SW2	22	Right Upper Cover	A12, H5
SW3	44	Main Power	L4
SW4	45	Front Cover Safety	A12, H2, H5
SW5	43	Upper Paper Size	Q9
SW6	42	Lower Paper Size	Q9
SW7	57	Duplex Unit Open	G5
Magnetic Clutches			
CL1	30	Transfer Belt	K1
CL2	32	Registration	I4
CL3	34	Relay	Q4
CL4	33	Upper Paper Feed	Q4
CL5	36	Lower Paper Feed	Q3
CL6	65	Paper Feed	Q6
Lamps			
L1	14	Fusing	(M7)
L2	47	Quenching	G1
Thermistor			
TH1	12	Fusing	(M7)



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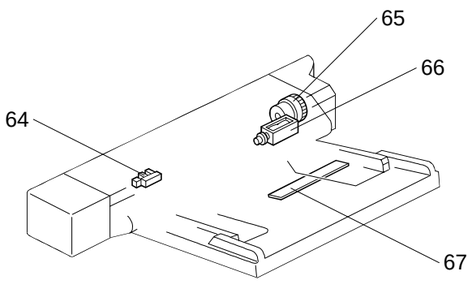

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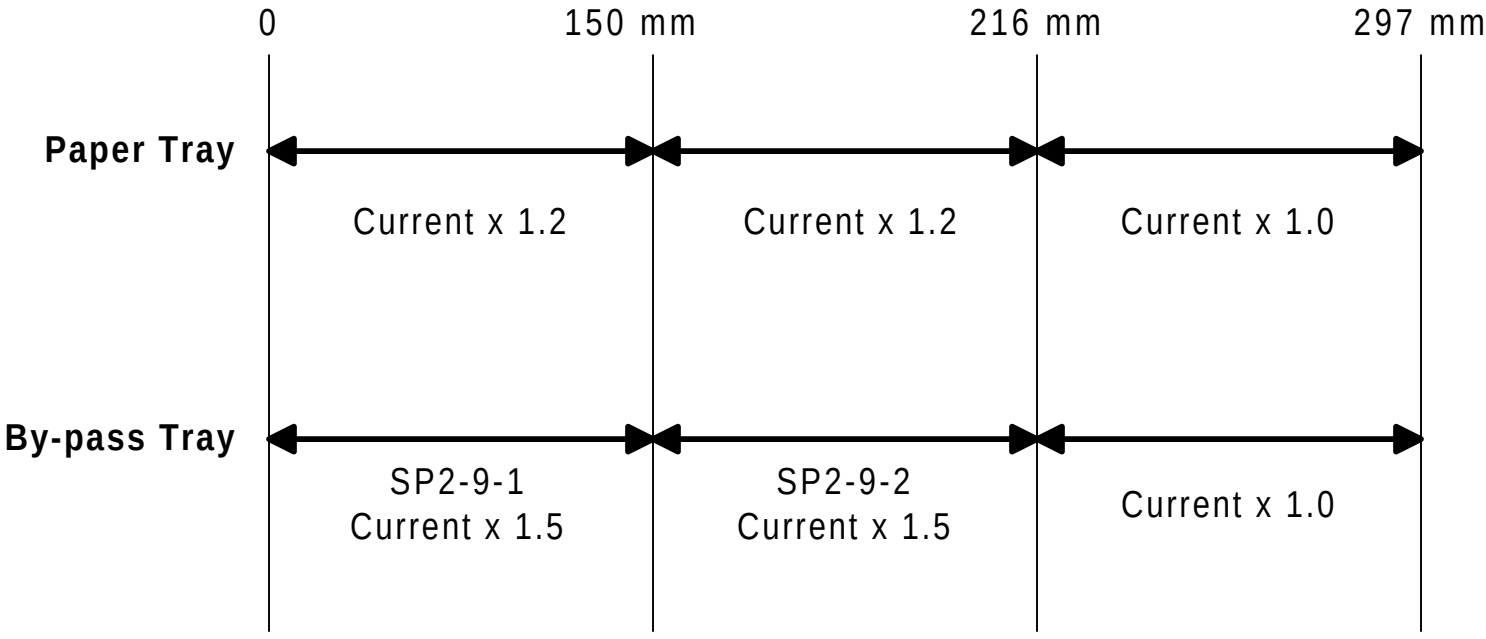
Symbol	Index No.	Description	P to P
Thermofuse			
TF1	13	Fusing	(M7)
Solenoids			
SOL1	58	Inverter Gate	D5
SOL2	66	Pick-up	Q6
SOL3	23	Duplex Junction Gate	L1
SOL4	27	Exit Junction Gate	L1
Others			
HDD1	4	Hard Disk Drive (Option)	K9
HDD2	5	Hard Disk Drive (Standard)	E12
LSD	21	Laser Synchronization Detector	A11


0
150 mm
216 mm
297 mm
Paper Tray
Current x 1.2
Current x 1.2
Current x 1.0
By-pass Tray
SP2-9-1
Current x 1.5
SP2-9-2
Current x 1.5
Current x 1.0